Is real study tour 2008

Final Report

January 2009 -Electrotechnische Vereeniging - Delft University of Technology

Stel, in een voetbalstadion wordt het licht aangedaan. Dan moeten de televisies in dezelfde wijk het natuurlijk wel blijven doen. Dat is de taak van TenneT: elektriciteit voor iedereen. Altijd en overal. We zorgen voor continuïteit, zodat Nederland volop kan blijven draaien. Kortom, we staan aan de basis van praktisch alles. En daar kunnen we wel wat energie bij gebruiken. Jouw energie. We zijn op zoek naar technische toppers én andere talenten. Heb jij de juiste lading? Kijk voor de vacatures op **www.werkenbijTenneT.nl.**

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TenneT

Re{*is*}
is real
study tour 2008

Final Report

Electrotechnische Vereeniging
Delft, The Netherlands
established 1906

Re{is} is real study tour 2008

Is real study tour - Final Report

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Final Report Committee:
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Introduction

View on the old city, Jerusalem

Is real study tour Committee

From left to right: Silvian Bensdorp, Kenneth Odijk, Tamar Kranenburg, Steven Mulder and Rick van Akkeren.

The *Is real study tour* **is organized by the ETV Study Tour Committee, consisting of:**

Tamar Kranenburg	President
Kenneth Odijk	Secretary
Silvian Bensdorp	Treasurer
Steven Mulder	Commissioner Re
Rick van Akkeren	Commissioner Im

Preface

It was on November 8th that twenty-four students of the study association of Electrical Engineering arrived at Schiphol Airport. With a traditional nip of gin, the beginning of the *Is real study tour* was a fact. The next two weeks of our life we would spend in discovering a relatively young country. Nevertheless, this country is rich of traditions, contradictions, cultural sights and - of course - technology.

The study tour was characterized by a great diversity on all kinds of fields, which is at the same time an excellent base for learning. During the first week we stayed in the white city of Tel Aviv while enjoying its wonderful beach in our spare time. The pleasant climate was a great opportunity to process all impressions we picked up during the day. It was in the first week as well that we made a visit to the impressive city of Jerusalem. This city brings you to the heart of a conflict of many religions. If you want to try to understand more about the conflict, you should go there by yourself. Or, as the prophet Muhammed puts it:

"Don't tell me how educated you are, tell me how much you have travelled"

The second week brought us to the largest city of northern Israel, the 'Rotterdam' of Israel, namely Haifa. This city is characterized by its mixed population of Jews and Arabs. The first thing you will notice when you enter this city is the huge Bahai World Center and its famous gardens, which is described best as the eighth wonder of the world. The 1700 steps of the stairs lead you alongside nineteen terraces surrounded by beautiful gardens.

You would almost forget that during our stay in the Holy Land, we have also visited sixteen companies and three universities, paid a visit to Palestine (more precise the West Bank), been to the Dead Sea and saw the Golan Heights. And as if this was not enough, some of us even received a text message to welcome us in Jordan.

This final report marks the end of a journey and the end of the task of the *Is real study tour* Committee. It was a trip never to be forgotten, and this final report contributes to perpetuate all facets of the *Is real study tour*.

Tamar Kranenburg
President of the *Is real study tour* Committee

Final Report Committee

From left to right: Stephan Groot, Bas van Kester, Pim Tamerus, Tim Velzeboer and Hugo Poley

The *Is real study tour* **Final Report is made by:**

Stephan Groot	Chief Editor
Bas van Kester	Commissioner
Hugo Poley	Commissioner
Pim Tamerus	Commissioner
Tim Velzeboer	Commissioner

Editorial

November 8th, 2008. Even before the crack of dawn the 24 participants of the *Is real study tour* are grouping in the entrance hall of the national airport, anxiously looking forward to the coming study tour. Some seize this opportunity to fill their stomachs with a tasty burger, others compare the size of their luggage, feeding their worry for overweight. After a supporting drink, provided by the board of the ETV, the tour is officially started. Only fifteen days later, the participants find themselves again at the airport. This time slightly more exhausted and with nothing left of the study tour to look forward to...

Luckily, looking back to past events can be quite as satisfactory as looking forward to them. This is where the purpose of the final report becomes clear, since this report satisfies in the craving to relive the study tour.

What can you expect from this report? First, this report contains a diary from all the action experienced during the study tour. Thanks to the efforts of the Diary Committee, consisting of Corné van Eeden, Frank Gorte and Johan Splinter, we are able to give you a complete description of all the activities. Furthermore, one can find a complete list of all the visited companies and institutes, complete with relevant information about these companies. Finally, this final report contains a section which captures the impression of the tour. Not only do all the different participants of the study tour give their opinion about the experiences gained, but this section contains also some memorable remarks made during the trip, and even a nice recipe from Israel's national dish: falafel.

With the convinction that everyone will reach for this report, when seeking the memory of the *Is real study tour,* I conclude by wishing you a lot of pleasure while reading this report.

Stephan Groot
Chief Editor of the Final Report

Committee of Recommendation

The people in this board recognise the value and importance of the *Is real study tour*.

Academics

- Prof.dr.ir J.T. Fokkema
  Rector Magnificus of the Delft University of Technology
- Prof.dr. D. Lenstra
  Dean of the faculty for Electrical Engineering, Mathematics and Computer Science of Delft University of Technology
- Prof.dr.ir L.P. Ligthart
  Director of the International Research Centre for Telecommunications and Radar of Delft University of Technology

Industry

- Th.M. Cohn
  Former Chief Executive Officer of Siemens Nederland N.V.
- Ir. G.J. Kleisterlee
  Chief Executive Officer of Royal Philips Electronics B.V.
- Ing. M.C.J. van Pernis
  Chief Executive Officer of Siemens Nederland N.V.

Institutes

- Ir. J.A. Dekker
  Chairman of the Royal Institute of Engineers of the Netherlands KIVI NIRIA
- Prof.dr.ir N.H.G. Baken
  Chairman of the Dutch Electronics and Radio Association (NERG)

Sponsors

The *Is real study tour* was made possible by the generous contributions of the following companies:

Industry

- Dutch Space
- Eaton
- Gusto MSC
- Huisman
- KEMA
- Siemens
- Tennet
- Volare

Funds

- University Fund Delft
- Executive Board Fund of Delft University of Technology
- Professor Gelissen Fund
- VSSD Study Tour Fund
- NERG

Part 2
Organization

Kibbutz Nir-David (Tel Amal)

Organization of the Study Tour

What does it take to organize a Study Tour?

On November the 16th of the year 2007 a group of five dedicated students started organizing a study tour. At that time we only knew that we had to 'go to some country at some time with some students of electrical engineering'. This chapter gives some insights into the process of transforming our mission into a valuable addition to the long history of study tours of the ETV.

Getting ideas

Once the committee was formed and the tasks were distributed, our quest started with defining the objectives for this study tour. The previous COLUMBUS STUDY TOUR had been a so-called 'long study tour', with a duration of four weeks travelling through North and South America. Traditionally after a long journey, a short tour is organized. However, we did still wanted to create something that was comparable to the previous tour, which set a very high standard. We realized that the only way to accomplish this was by visiting a country which has more to offer than technology only.

With this in the back of our minds we made a list of interesting countries where the ETV had not been for some time, and tried to find out if there was enough to see and learn in that country. Soon we had a shortlist of potential destinations: Sweden, Finland, Dubai, Switzerland, Italy, Denmark, Norway and Israel.

We immediately had a good feeling about going to Israel, but were afraid that there would not be enough to do for two weeks, so we looked at the possibility to combine this with another country. With this list of first ideas we asked several professors of our faculty for their opinion. The idea that Israel could not offer enough technological diversity quickly evaporated. Israel could offer us everything we were looking for. Besides advanced technology the country enabled us to give something extra to our participants: a broader, enriched view on Israel and the Palestinian conflict.

Coming up with the name and logo

The next thing to do was selecting a proper name and accompanying logo for our trip. After some brainstorming we had several good (and bad) ideas, among others the Temperatour and Flip Flop Trip. The choice fell on *Is real study tour* for its clear connection to our destination, and a good idea for the logo. People who are familiar with complex number theory will see the link between 'Is real' and 'Re{is}'. What is not so clear for English speakers is the fact that 'reis' is also the Dutch word for 'journey'. In Scrabble we would have definitely earned triple word score.

Recruiting participants

At the time the decision was made to visit Israel we had to find twenty-four participants ready for adventure. So, after two months of preparations we started a promotion campaign to recruit participants. A lecture was planned during a lunch break in which we presented our ideas, but to our great surprise very few people showed up. Did we take too much hay on our fork? Was the ETV not ready for a visit to Israel? A day before the end of the subscription period approximately twelve registrations had come in… Fortunately, on the last day of registration the amount of registrations more than doubled, which was a big relief for the committee.

Acquiring finance

Our financial situation was quite okay. With the contribution of the participants we raised half of the budget. Another part of the required funds was invested by the faculty, our study association, and several other non-profit organizations. Finally several sponsors supported our tour, by placing advertisements in one or both reports to fulfil our financial needs.

Inviting accompanying professors

When talking to faculty members about possible destinations, there were two professors who really stood out. We officially invited professor L.P. Ligthart (Telecommunications, IRCTR) to accompany us during the first week and professor J. Hellendoorn (DCSC) to accompany us during the second week. They immediately accepted our invitation, and both professors actively contributed to the organization of the study tour by putting us in contact with a lot of influential people.

Making contact with the Promised Land

We easily gathered many contacts at various companies and institutes in Israel. Soon we sat around the table in the meeting room of the ETV with Mr. Cohn (former CEO of Siemens Netherlands) and Mr. Kurtz (Kurtz Marketing Management) who suggested many possible visits to companies and institutes. Besides, the dean of our own faculty put us into contact with several institutes. We also discovered that Israeli people are very enthusiastic about their country, and many of them contributed in the organization. One of them deserves a special mention: Yvonne Sagi of the Technion, who advised us on a couple of practical issues for our stay in Israel. All of this had put the organization into a next gear and a first itinerary quickly arose from the drawing board.

Planning logistics

Several weeks after making the first contacts with the Promised Land we had an incredible busy schedule and were in the position where we had to choose what we did and did not want to visit. Admitted, this is a great position to be in but we realized that transportation between the excursions was turning out to be the most important problem we had to solve. This appeared much more difficult than we anticipated. There were three major problems and several minor problems we had to solve. First of all we did not have a good map of Israel and were unable to estimate the travelling time very well. We therefore ordered some maps in Israel and had them shipped to the Netherlands. But it was still hard to find the information we needed. Fortunately, a month before departure Google released detailed maps of Israel with which we could optimize our itinerary.

The second problem was that the budget for the cars was far too tight and that at most companies the drivers had to be twenty-six years or older. After a lot of searching and calling for help to our advisors we ultimately found a rental company which had relatively cheap cars for twenty-four year old drivers. However, we still had to cut in the budget for the accommodations. We owe a special thanks to the six man drivers' guild, who handled the big responsibility of driving everyone around.

Finding accommodations

Israel has a variety of accommodations ranging from cheap hostels to expensive five star hotels. We decided to use this as a financial buffer. Both in Tel Aviv as well as in Haifa we stayed in reasonably priced Lonely Planet recommended hostels. In Haifa the reception closed at eleven o'clock which gave the opportunity to come home while making a lot of noise. Not everybody was very pleased with this, but we had a lot of fun.

Organizing excursions

As already mentioned there were no difficulties in finding diverse and enough excursions. Even during our stay in Israel several more excursions were organized. Besides visiting a large variety of technology related companies and institutes we managed to organize - from within our hostel room - a Bauhaus excursion, a West Bank excursion and a Kibbutz excursion. These excursions really gave another dimension to our visit to Israel.

To conclude

Organizing a study tour had been a challenging experience. In the process of organization you will acquire several skills, and this will enrich your personality. I can highly recommend to anybody who gets such an opportunity to take it with both

hands. Besides, it had been a pleasure to work together with people from the Netherlands and Israel who were willing to invest their time in our organization.
We can look back to the past year - and especially to the two weeks of the Is real study tour - with great pleasure and expect that many study tours will follow. Le'chaim!

The *Is real study tour* Committee

Tamar Kranenburg
Silvian Bensdorp
Kenneth Odijk
Steven Mulder
Rick van Akkeren

Subcommittees

Without the help of our participants, it would not have been possible to organize such a great study tour as this one. All of the participants took place in one of the subcommittees. The Is real study tour committee is very grateful for their help. Below, you can see who did what during the tour.

Symposium Committee

Members: Rico van Dongen
René van der Meij
Michel Verhulst

As part of a sponsor deal with NERG, this subcommittee helped organize a symposium. The symposium was held at Delft University of Technology and both Rico and René gave presentation representing the new generation. A more complete description of the symposium can be found elsewhere in this report.

Preliminary Report Committee

Members: Erwin Stout (chief editor)
Daniël Petrarca
Ate Kleijn
Maarten Kastelein
Tom Verboon

The Preliminary Report was made as part of the preparation process for the study tour. In this report the subcommittee compiled information about the Delft, the participants and our plans for the tour, including descriptions of all the companies and institutes we were going to visit. The Preliminary Report was also one of the presents we gave to the people who helped organizing the visits in Israel.

Photo Committee

Members: Matthijs Alderliesten
Geert Berghuis
Tim Hurkmans

The Photo Committee was charged with the task of capturing the sights of the tour. During the tour they took pictures of all events, and afterwards they tackled the daunting task of sorting the 6,500 photographs taken during the two weeks in Israel. Based on their selection they created the official Is real photo album and photo DVD.

Diary Committee

Members: Corné van Eeden
Frank Gorte
Johan Splinter

The Diary Committee served as the collective memory for the participants. During the tour they took notes about everything that happened. These notes were processed to become the diary part of this final report. Besides the diary, they also collected various remarks worth remembering, and held a popular questionnaire among the participants.

Final Report Committee

Members: Stephan Groot (chief editor)
Bas van Kester
Hugo Poley
Pim Tamerus
Tim Velzeboer

Building on the work by the Preliminary Report Committee, Photo Committee, and the Diary Committee, this subcommittee put together the report you are reading right now. They did the necessary formatting for the diary, the impressions of the participants and all other information. The final report is the main memento for the Is real study tour participants, so a lot of effort was put in its creation.

Drivers Guild

Members: Amy (chief navigator)
Geert Berghuis
Steven Mulder
Kenneth Odijk
Hugo Poley
Erwin Stout
Tim Velzeboer

During the tour we used three Peugeot Expert minivans to transport the group to all the places we visited. The Drivers Guild had the task of getting everybody there safely and quickly, through the crowded Israeli streets. All members of this Guild (with the exception of Amy) also took place in other subcommittees, which makes their effort even more admirable.

Symposium

On the 17th of October, a symposium was organised by NERG and KIVI NIRIA on the subject: “De ingenieur terug in het maatschappelijk debat” or in English: “The engineer back in the public debate”. The day was lead by president of the day Kees Mijnten. Prof. Baken started the symposium with a brief story to introduce the day. After this Kees Mijnten asked questions to people in the audience to make sure everybody stayed involved.

The first guest was Diederik Samson, who is a member of the Dutch parliament party PvdA and has studied Nuclear Physics at Delft University of Technology. He told us what the role of an engineer should be in politics and came to the conclusion that we should leave politics to the people in The Hague as the engineers are to hard needed at their own places. Engineers should of course supply information to the politicians if needed.

Gerlof Bosveld was the second person to speak. He has studied Applied Physics at Delft University of Technology and currently works at TNO. After explaining the meaning of the words ‘ingenieur’, ‘terug’ and ‘maatschappelijk debat’, he continued with his actual presentation. He also came to the conclusion that engineers can better stay out of politics and stay at their own work area.

The third speaker was Albert Smit. He studied Technical Business Studies at Eindhoven University of Technology and is now president of his own company Milestone Marketing. His story was aimed at how an engineer can improve in spreading his message, a problem that many engineers encounter.

For the final part the study tour committee of the ETV was asked to contribute to the symposium. Two students briefly introduced and presented their theses. These were:

- Facts are not relevant in large debates
- The engineer stays to much in his own specialism without looking to other areas.
- There is no room for progressive insights.

After all these theses there was a discussion with the guest speakers and the audience supervised by Kees Mijnten. The afternoon was closed with some drinks.

Preparation Week

In the week before the study tour several activities were planned. The purpose of these activities was to acquire some knowledge about our destination and its culture, and to get to know each other.

Tuesday December 4th was to become a day of different views on Israel in general, and the conflict between Israel and Palestine in particular. In the morning we took off to The Hague to visit the Israeli Embassy. The security measures were severe. After entrance, each person was brought to the basement one by one. In the basement the metal detector took care of each member of the group, while the X-ray scanner was used to scan the belongings after which they were safely put away in a locker. Of course a routine passport check could not be left out.

After the security measures the group was welcomed in a meeting room where coffee, tea en orange juice were offered. Hamutal Rogel-Fuchs, Secretary for Press, Public & Cultural Affairs, welcomed us on behalf of the Embassy of Israel in The Hague. Mrs. Rogel-Fuchs explained us she would not give us a lecture about Israel, but had decided to organise a meeting instead. During this meeting the group would be allowed to ask questions so the group could get a more sophisticated view about Israel.

In her introduction Hamutal Rogel-Fuchs described the change of the view Western countries have towards Israel. During the founding of Israel the country was seen as the Promised Land, especially by the Christian church. During the decennia which followed this view changed, partly as an effect of secularisation. Nowadays Israel is associated to the Israel/Palestine conflict by most people. The first city the participants would visit however, would not fit in our picture of Israel because the conflict is hard to find in Tel Aviv. Tel Aviv is more of a party city, comparable to Amsterdam, she explained.

A big difference would be the weather though. Complains from Israel had reached her concerning cold nights, about 15 degrees Celsius. Since Israel does not know fall the way we do, she called this winter.

A discussion about Israel would not be complete without addressing some time to the conflict between Israeli and Palestinians. Mrs. Rogel-Fuchs introduced us to the conflict from her point of view. Although struggles cannot be denied she mentioned that problems with the integration between Western culture and Arab cultures also occur in the Netherlands. In response to the committee's comment we would get a lecture about the conflict in the afternoon by drs. Paul Aarts she encouraged us to get different viewpoints on the conflict. There is no such thing as an objective truth.
During the meeting participants of the Study Tour took their chance to ask a lot about Israel. Hamutal Rogel-Fuchs did her best to answer all of them, but also encouraged the participants to talk to people in Israel. People are very open to talk about all kind of subjects and most of them are willing to speak English.

After the visit to the Embassy we went straight back to Delft where drs. Paul Aarts would give us a lecture concerning Israel. He emphasised the fact that he was introduced as being an expert on the Middle East conflicts. He explained he is an expert on the Middle East in general, but everyone tends to associate this area immediately with conflicts. He also explained us that the news about Israel is almost without exception biased. Therefore Paul Aarts promised to give us the objective truth about the situation in the middle east, but not without mentioning the Israeli Embassy would most likely call his version pro-Palestine.

To understand the conflict a short introduction about the history of Israel and the surroundings is essential. For centuries Jews and Muslims lived peacefully together in Israel. The first Zionistic Jews came to Israel in the beginning of the 20th century. The response of the Palestinians was a more nationalistic approach towards Jewish people. An important milestone in the history of the constitution of Israel was the declaration of Balfour, in which "the establishment in Palestine of a national home for the Jewish people" was mentioned. This declaration caused an increase in the number of Jews immigrating to the promised land. After the Second World War the State of Israel was established in 1948.

The Q&A in the end of the lecture enabled the attendees to ask Paul Aarts for a response towards the opinions of Hamutal Rogel-Fuchs. He agreed that the foundation of a really democratic society with an Arabian culture would be without precedent. In contrast to the opinion we heard earlier that day he did not blame this on the culture in the Arabian countries, but to the meddling of Western nations in local affairs.

On Thursday December 6th the fellowship went to Amsterdam to visit the Jewish Historical Museum. Although this museum mainly concerns the history of Jews in Amsterdam, it could also provide a welcome addition to our knowledge about Judaism in general. The museum, located in an old Synagogue, used articles, pictures, movies, sounds and artworks to accustom the visitor with Jewish rituals and stories. After this visit the group went for its first social activity. In the former pumping station of an old water tower we had an excellent dinner, and of course the possibility to get to know each other a little bit better.

Part 3

Diary

View on Tel Aviv from Jaffa

Day-to-day programme

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Tel Aviv

Azrieli Center

Saturday, November 8th, 2008

Saturday November 8th, 2008, 24 students embarked on the *Is real study tour*. For the Electrical Engineering students who were about to depart to Israel, the day started early. About half the group left 3:11 AM from the train station in Delft, after having little or no sleep. Some board members of the ETV were present to see the group leave for this first part of the journey.

At 4 AM, we gathered at Schiphol Airport and were complete for the first time. The ETV-board, together with some parents, girlfriends and the sceptre of the ETV were present to see the group depart. The two Presidents of the ETV and the Study Tour Committee gave a farewell speech and a toast was made with the traditional drink of the ETV 'Vlek'. Also the first group photo was made and the counting game was performed the first time, to check whether everybody was present. Sadly it was without success, which proved to be a measure for the success rate of counting games during the rest of the trip.

After a successfully checking in, the flight first left to Zürich. After a short layover, the trip continued to Ben Gurion International Airport, Tel Aviv. At 3 PM, we arrived in Israel. We were welcomed by an outside temperature of 28 degrees Celcius, after seeing snow in Switzerland just hours ago. In the late afternoon, we arrived at the Hayarkon 48 Hostel in Tel Aviv. The hostel is located just one block from the beach and was to be our ground base for the first part of the trip.

That night, the group split up in smaller groups to get dinner, explore the neighborhood and get a first taste of the Israeli food, drinks and night life. Being exhausted from the long trip and the little sleep we could get on the plane, most of us went to bed early.

Sunday, November 9th, 2008

Most of us woke up early from the traffic on the Ha-Yarkon street in front of the hostel, and we knew soon that the boys in the back of the hostel were the lucky ones. Since the hostel is only 130 meters from the beach, a couple of us decided to get a bath in the Mediterranean Sea, which was remarkably warm (23 degrees Celsius) in November. Although our North Sea does not get much warmer during summer time, inhabitants watched us like taking a bath at Scheveningen in January.

The hostel served a free breakfast which consisted of just some bread to be toasted and a sweet jam and maybe some kind of croissants. After getting breakfast we went to Ashkelon in the south west of Israel. Even though this was the second day for our drivers on the Israeli roads, it went remarkably well. Everybody had to become used to the bumpy roads, which got more bumpy the more we approached rural areas. Luckily we made it on time and passed the Rutenberg Power Station gate without a security check. After placing a hard hat on our heads we continued on the premises of Israel Electric Corp, which consists of a large coal storage, the power plant and a facility to unload coal from a seagoing vessel.

Our visit at Rutenberg started with a presentation on "Worldwide Power Production Trends". The power plant is named after Pinhas Rutenberg, IEC's founder in 1921. IEC built it's first power station in the river Jordan in 1923, a hydro electric plant. The guide told us about the large increase in demand of electricity predicted for 2030, an worldwide increase of 85%, mainly to be provided with coal and natural gas. Conventional coal and natural gas is the main provider because the supplies last for at least 200 years, and unconventional resources last for more than a few centuries.

Unlike today's structure in Europe, Israel only supplies its own electricity, it is in so-called 'island operation'. Israel has an installed capacity of 11,297 MW, about half of the Netherlands and 1.5% of EU's total capacity. Despite 'some emission problems', IEC (main supplier in Israel) will be using coal for the next decades. IEC does not install much natural gas plants because Israel depends on Egyptian natural gas. Nuclear energy is not an alternative either, since Israel is one of world's four countries not in the Nuclear Non-Proliferation Treaty.

The plant at Ashkelon consists of two sections, one built in 1990-1991 and one in 2000-2001. Four turbines and four generators are operated, summing up to 2,250 MW. The unit supplies a large portion of the base load and roughly 30% of the total demand. To ensure power delivery, it keeps a stock of 600,000 tons of coal, enough to power the plant for 45 days, a pile of 15 hectares. Coal is unloaded in front of the plant on a 2 kilometer long pier.

The visit continued with a tour of the 70 meter tall plant. On top of the plant it was possible to see the Gaza Strip which fences are 5 kilometers away. The plant tour showed us again the need for a large site and the more than 500 employees. To generate two times 500 MW and two times 550 MW, every boiler is fed with 200 ton of grained coal an hour and every boiler emits 20 ton ash an hour, you can find it everywhere on the plant. The plant was constructed with economics and ecology in mind and confirms to Israeli environment regulations, which are derived from EU regulations. The boilers produce sub critical steam of 535 degrees Celsius at 170 bar. Four turbine-generator sets are driven, each in size larger than a lorry.

IEC provided us with a very extensive and tasty lunch, consisting of a wide range of salads and – surprising everyone – a second course of meat, fish, rice and potatoes. We left fifteen minutes late to Rutenberg's neighbour, VID Desalination Plant.

Ashkelon also houses world's largest and most advanced seawater desalination plant, built by a consortium of French and Israeli companies. The plant has a size of seven hectares and supplies potable water and agricultural water, 110 million cubic meters a year (average 3.5 m^3/s). Reverse osmosis of Mediterranean Sea water is done in several steps, to be explained later. The visit started with a short introduction on the construction of the plant, which is operational since March 2007, and on the desalination itself. An extensive tour followed.

Since Israel has a severe water shortage for agricultural and drinking applications, several measures have to be taken. Historically, water was supplied from the north of the country from the Sea of Galilee and the Jordan and a transport system was built in which water flows from north to south. Agricultural water has different requirements than potable water, despite that the system is not divided into agricultural and potable water sections. A new desalination plant with the same size as this is planned between Tel Aviv and Haifa, and new plants will be constructed in the north of the country because of the one-way transport system.

As indicated, the process is not as easy as one might expect. When a semi permeable membrane is placed between waters with different salt concentrations, a flow of water molecules starts to equalize the concentrations. If the seawater is pressurized to 33 bar, the osmosis stops. When the pressure is raised the osmosis reverses and water molecules pass the membrane to the potable side. To do this with some speed, 70 bar is used.

When water is taken from the Mediterranean Sea, it first has to be cleaned to get it very clear and microbiological clean. This is done with commonly used slow sand filters, which are located in a large shelter. The clean but salty water is pressurized with very noisy 5.5 MW electric pumps, and flows to the desalination membrane. Membranes are fit in a 20 cm diameter pipe with a honeycomb like structure, in one meter sections containing 37 m^2 each. In the center a smaller and porous pipe carries the desalinated water. Multiple desalination steps are applied, kilometers of interconnected filters are stored in a large hall. Thirdly, boron and other minerals are removed to meet the agricultural requirements. These minerals are not harmful to humans, but are to improve growth. Now the water is about as clean as purified water and not healthy. The fourth step is to add a sour and grained limestone to bypass this. Finally the potable water is stored in a nearby facility for distribution. The sea water, which is now twice the salty, is mixed back into the sea. If maintained well, the filters and membranes can be used for more than twenty years.

The process is much more energy efficient than distillation, but still requires 56 MW of power. About 40% of the energy put in the highly pressurized salty water is recovered using an advanced piston system, acting like a reverse. To meet reliability and economic criteria, an 80 MW natural gas combined heat and power (CHP) plant is built next to the facility.

The visit at Ashkelon Desalination completed with a visit to the CHP plant. An operator explained us the process of getting the natural gas ready to fire the boiler and showed different sections of the facility. The heat emission in the turbine room was impressive, despite all insulation. Also, the manager explained to us how the plant is operated with respect to IEC, the de-facto power producer in Israel. The signs to find the air-raid shelter confronted us again with the Israeli-Palestinian conflict and the vicinity of Gaza Strip. Finally, we headed back to Tel Aviv in an 1½ hour trip and explored the city for dinner.

Monday, November 10th, 2008

We left early to Sde Boker, located in the middle of Negev desert in the south of Israel, to visit Ben-Gurion University (BGU) of the Negev's desert research facilities. After a trip of several hours, we arrived on the hot Midreshet Ben-Gurion campus located next to an army air base. Architect dr. David Pearlmutter welcomed us on behalf of the Center for Desert Architecture and Urban Planning and started the campus tour. His group addresses the issues of building in the desert, particularly the Negev. BGU was mandated in 1969 to develop the formerly underdeveloped south of Israel. Because all kinds of resources are limited in desert regions, several architectural techniques were developed to make life more durable and comfortable. A short overview of solutions shown:

- Put water on the roof at night, it emits longer IR waves than the roof itself, thus accelerating the cooling of the building. Requires clear sky.
- Use thick walls (0.5-1 m) with insulation, acting like a heat buffer. Temperature variations during the day are 15-30 degrees. The walls keep the heat out during the day and the cold out during the nights. This can be improved when the wall is 'rotated' during the evening, in that way cold stones absorb heat during the day and emit heat in the building during the night. Equipment to do this was shown.
- Build below ground level. One meter lower temperature does not vary during a day, at ten meters below ground level temperature is stable during the year.
- Löss – very common in the Negev – and water can be used to make bricks, but a stabiliser has to be added.
- One of the offices has a cooling tower. In a central hall some chimney-like structure is built. In the upper part a spray of tiny water droplets is released and bigger droplets which fall down. The spray evaporates, cooling down its environment and the air flow caused by the bigger droplets takes it down. The system is economical regarding the water usage, and requires outside air with low (<30%) humidity.

Second, we continued to Shoshana Dann at BGU's National Solar Energy Center, also in Sde Boker. Here, various techniques are employed to test solar power in the field. For example, we saw a more than 20 meter sized elliptic paraboloid mirror constructed of flat mirrors. This mirror focuses the radiation of about 400 m^2 on less than 1 m^2, thus enabling high temperature research on e.g. photovoltaic (PV) panels. The system can track the sun from sunrise to sunset. Because this is a research facility, the mirrors can individually be focussed from a 1 m^2 spot to a 1 cm^2 spot. Currently this is the largest concentrated solar power facility in the world.

The arid desert also allows for durability tests. Since Sde Boker has unique weather conditions – e.g. sandstorms, heat, rain – various manufacturers send their PV panels to test and measure their degradation. One year at this site gives about the same wear and tear of five years in Europe.

Our visit in Sde Boker closed with a very short visit to the Zuckerberg Institute for Water Research. We headed on to Be'er Sheva and had a tasty lunch in the canteen of BGU's main campus. Be'er Sheva is located to the north of Sde Boker, however has historically been seen as a remote city. Nowadays the city harbours about 200,000 citizens.

After the lunch we had a tour on the vast campus. Most buildings are constructed in the sixties and seventies, in a style similar to Delft's Aula. Since 1996 the number of students in Be'er Sheva saw a tremendous increase, from 5,000 to 12,000, and that's why the municipality and American investors invested a lot in new buildings.

The visit continued with three presentations by faculty members of the Department of Electrical and Computer Engineering. Prof. Amir Geva told us about applications of signal processing and pattern recognition in medical apparatus. He explained to us how they use EEG to get a better understanding of neuroplasticity, the process of changes in the brain due to experience. With videos he showed how they apply EEG, pattern recognition and interaction with a patient, to train certain functions in a damaged brain. Despite all positive results, convincing doctors is one of the harder parts, and is estimated to last the next five to ten years.

Dr. Amiel Ishaaya continued the series on his research on high power lasers and nonlinear optical devices. The issue he addressed is the optimisation of laser output and beam quality in confined spaces. Beam quality can be increased with an aperture, but this reduces output power. Using a phase selector, one can select the 'good' modes of a low quality high power laser beam. A second solution is to combine lasers, a difficult job is to synchronize them. Thirdly, one can use the property that a laser strives to minimum energy losses to synchronise multiple lasers. Ishaaya investigates the possibilities to use resonators for this synchronisation.

Last but not least, dr. Rafi Shikler explained his work on the use of polymers as semiconductors in photovoltaic systems. The current bilayer polymer PV's have an efficiency of a mere 1.5 % and this can be improved when the polymers are mixed. The degree of mixing determines the efficiency, but the best way has not yet been found. Very thorough mixing (tiny droplets A in B) does not mean great performance, a moderate mixing neither.

Finally a very different subject was addressed: the Community Action Unit. This is an unique and extensive program to focus BGU's human and academic resources on the educational and social problems of the region. About 6,000 students, one third of the student population, participate in various projects. Four students told us about their contributions:

- Training a guidance dog for blind people, from the age of 8 weeks to one year old. As most projects, it does not return money, in this case only food for the dog.
- Guide and help raise children of about 12 who are in severe situations, the army encourages this because they can be recruited later.
- Open Apartment, students share a free apartment in one of the poor districts. About four hours a week they teach e.g. Hebrew or English, and support neighbourhood activities. One or two times a week the children can visit the apartment.

Tamar, president of the Committee, closed the visit by giving away the traditional gifts: the Delft Blue earthenware plate with a study tour print, and small earthenware clogs. We returned to the rented Peugeot Expert vans and headed to Tel Aviv.

Tuesday, November 11th, 2008

Jerusalem is an old city and an important city to both Jews, Christians and Muslims. Today we were going to visit this capital of Israel.

The day started with six participants getting out of bed early to dip in the sea. After taking a shower and having breakfast we got into our vans and left for Jerusalem.

The traffic in Jerusalem was heavy and we had to call our touring guide, Rina, we were running late. After picking her up she told us about the elections that were going on for a new Major. We went Mount Scopus (lit. Mount Look Out), one of the mountains at the side of Jerusalem and had a nice view of the city. Our guide explained us the layout of the city and showed us where we would go to that day. The old centre of Jerusalem is walled and divided into four quarters: the Armenian, Christian, Jewish, and Muslim Quarters. The al-Aqsa Mosque with the golden roof stands on the place where the First and the Second Temple used to stand. The First Temple was built by Solomon, the son of king David, and destroyed by Babylonians. The Second Temple, which was much smaller, was destroyed by the Roman Empire. The only remains of it is part of the platform, known as the Western Wall or Wailing Wall. We would visit the wall later.

Before starting our tour, the guide preferred to speak the ritual words spoken by pilgrims coming to Jerusalem, and celebrating this visit with a non-alcoholic drink. Then she showed us a wall with the names of people who donated more than a million dollars to support the construction of Israel.

After a short stop on one of the other mountains, Mount Olives, we visited the garden of Gethsemane at the foot of this mountain. Christians believe Jesus came to this place to pray before he was caught by the Jews and delivered to the Romans who crucified him. Nowadays the church of Gethsemane has been founded in the garden, but still a number of olive trees can be found.

While driving to the next station we discovered the parking place was sold due to archaeological findings. “That’s the story of Israel”, our guide explained.

After our visit to the Western Wall, where Jews come to ask their Messias to come, not to wail, we went into the old city. We followed the way Jesus is believed to have walked with the cross: the Via Dolorosa, or Way of Suffering. This way ends at the Church of Golgotha. In this church there is a tomb which represents the tomb in which Jesus’ body was put away. We travelled through the old city to the Jewish Quarter back to our vans.

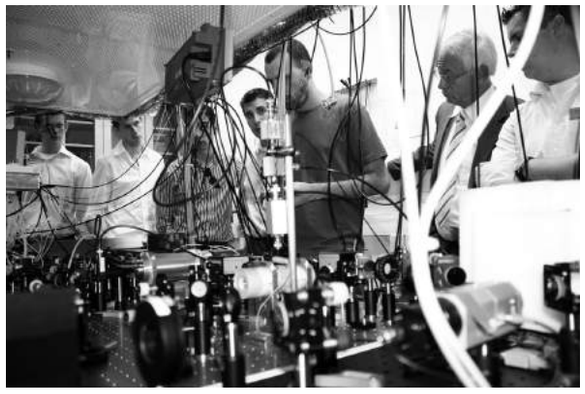
Driving through the busy traffic of Jerusalem we were very thankful we had brought our walky-talkies along. We went to the residence of the Knesset, the parliament of Israel. In front of this building stands the Knesset Menorah, a sculpture of the seven armed candelabrum, decorated with stories from the Torah. The British mandate gave this sculpture to the parliament of Israel during the transfer of power.

After a visit to the Israel Museum, where a miniature version of Jerusalem is displayed, it was running late. We decided to skip the Holocaust museum and went to the children memorial, dedicated to all Jewish children who died during World War II. The last place our guide showed us was Mount Herzl. In Israel Herzl is viewed towards a modern prophet. He gathered European leaders to talk about the constitution of a Jewish state in 1897.

It was getting late and the committee offered the participants the choice to watch more of the museum or spread through Jerusalem to diner. Due to people getting hungry the museum never had a fair chance. The group split up for a few hours, which gave some people the change to eat the biggest hamburger of their lifes and, most of all, contribute to the invention of the Toffee Nut Soda.

Wednesday, November 12th, 2008

By now, the organising committee and the participants would get used to getting up half an hour in advance of schedule. Therefore nobody was informed about another change in schedule, which shortened our sleep with another 15 minutes. The effect of that was nobody found time to dip in the sea. Even worse, nobody was in the mood for the trip we were going to make. To worsen things, due to irrelevant overusage the day before, the use of the walky-talkies was limited by the president to essential use only.



Arriving at the Weizmann Institute in Rehovot we were welcomed by Nir-Bar Gill. While standing in the campus of what at best can be explained as the Israeli TNO, he told us about the institute. Chaim Weizmann was not only the first president of Israel, he is also known for being a great chemist. He invented a synthetic way to manufacture acetone. The institute gives both master and PhD degrees. The Weizmann institute is responsible for a lot of inventions and patents, including RSA encryption, Nir-Bar Gill told us. Before we went in, he told us about the buildings we could see, of which some would be visited later that day. Among others the institute possessed a particle accelerator. This accelerator was not used to study the effect of collisions, but to create defects in materials.

The first lab we visited was in the Physics building. In this lab research was done on trapping ions. Because an isolated ion has hardly any interaction with its environment, it is very useful for storing information, and could therefore be used to create a quantum computer. Another usage of atom optics is the optical clock. Due to improvements this clock recently became more precise than the atomic clock. A member of the lab explained us the set up of the experiment and the optical tools used for the experiment. In the set-up an ion can be trapped in a high vacuum chamber for hours.

After the first lab the group was split. The subgroups went to different optical labs. The first lab combined quantum mechanics with optics in quantum optics. This concerns the scale of optics for which Maxwell's laws do not apply, for example single photons. A green laser beam goes through a crystal which splits every photon in two. This creates a special infrared laser beam with an even number of photons. Using a crystal which reverses the first crystal, but only if two photons arrive at the same time within 10^{-15} s. In nonlinear optics lab, high powers are used, compared to quantum optics. Using beams with a high intensity the optical properties of materials change. This way THG microscopy is made possible.

In the next lab we visited, a room filled with the noise of a laser. The guide explained electronics are to slow to capture physics and chemical processes. Therefore pulsed lasers with a pulse duration in the order of femtoseconds are used. Shorter pulses are not possible due to limits imposed by the wavelength.

The last lab we visited measured and controlled the properties of nanocrystals. The concept of nanocrystals was explained to us. If you split a crystal on macro scale in two, the two parts still have the same optical properties as the original crystal. But if you split a very small crystal into two nanocrystals this does not hold. The lab manipulated the properties of these crystals.

After our visit to the nanolab we visited the solar tower. In an introduction we heard this world has enough oil and gas for the next 200 years. The problem with these sources however is the emission of CO. A solution would be solar power. Our guide stressed the fact that less than 50% of our energy is consumed as electricity. Another important usage is heating. With direct solar rays however it is not possible to heat up high enough. The Weizmann Institute therefore develops mirrors that concentrate solar beams to create a beam which is a thousand times as intensive. In contrast to the Ben Gurion University, the Weizmann Institute does not concentrate on photovoltaics. Also, so they claimed, their methods would be cheaper in comparison.

Behind the solar tower we found a field with artificial trees. These fields actually were pillars with mirrors on top of them, called heliostats. These mirrors can be used to concentre the solar beams on a spot on top of the solar towers. However, because there was no experiment running, the mirrors were turned upside down so we could see ourselves in a birds eye view. This is done to prevent dust gathering on top of the mirrors.

After leaving the field of gigantic mushrooms we had a great lunch offered by the institute. We left the lunchroom to visit the submicron centre. This centre deals with everything smaller then 10-9m, but also works with very low temperatures, even colder than space. These temperatures close to 0 K are needed to observe quantum effects in two dimensional bodies. Reaching temperatures of 4 K is very easy, because Helium is frozen at this temperature. To reach 0.01 K however is much harder. Below a temperature of 0.1 K all physics change.

While guiding us through their DIMES-like facilities, the guide told us the centre grows its own wafers, some of the best wafers in the world. The guide explains to us the experiments will most likely not be useful for consumer products within our lifetime. He however, is enjoying the research, that is what drives him.

A number of PhD students got a chance to enrich us with their knowledge on Biomedical Science. They told us about the research to understand the functioning of the brain, and about creating DNA strings. The institute is not able to create large DNA strings, but is able to create smaller strings and compose them together into a larger molecule. In a simulation the target molecule is disintegrated to calculate the best way to build the molecule. After this presentation we are guided to a room where a liquid handling robot shows us his work. After seeing this fine piece of technology exactly the same thing is showed to us on Youtube.

The last presentation of the day concerns Molecular Syllogism. At first the concept of Logical programming is explained to us. The idea is DNA is a presentation of information. Because Engineers know what to do with information, they are able to handle DNA better than biologists would. The researchers use DNA to calculate the answer to queries programmed in DNA strings. A compiler used to compile a program written in Promolog into DNA. This technique might be used to detect cancer (a Promolog query) and to kill the concerning cells (a Promolog answer).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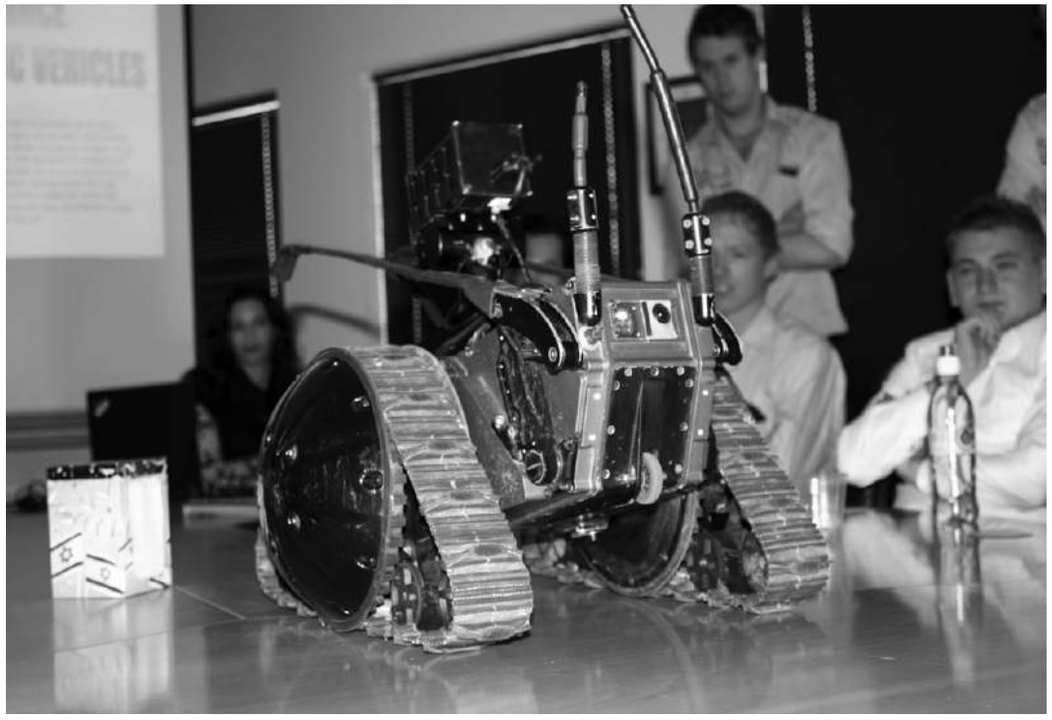
Thursday, November 13th, 2008

On the 31st floor of the Azrieli Center Triangle Tower in Tel Aviv Elbit Systems welcomed us. Elbit Systems is a large defense Electronics company with over 10,500 employees, 2 billion dollar of revenue and 155 million dollar R&D spending annually. The CTO of the land division gave the first presentation. He described Elbit: “We are dealing with the brain, not with the metal”. Elbit develops, manufactures and integrates defense electronic and electro-optical systems. The company’s highlights include the development of the helmet for the Joint Strike Fighter and being one of the first to use the concept of Unmanned Aerial Vehicles. They developed subsystems for the Apache, Boeing F-18, LM F-16 and the Blackhawk.

Elbit has 15 sites throughout Israel. Because it is hard to penetrate military markets in other countries, Elbit also has subsidiaries in many other countries, so they can work together with the companies located in that country. In the defense market it is a challenge for companies to work together. Many countries want to use systems from within their own country, like Israel did when they bought the F-16I, an Israeli version of the F-16. Israel demanded Israeli technology to be used in the airplane, but this gave problems in regard to where the responsibility for the total system was in case of failure.



After this introduction to Elbit, we received presentations about several products and technologies. The first subject was The Unmanned Turret. Weight is a serious issue for modern Armored Fighting Vehicles (AFV), used by the military to transport infantry and provide fire support for them. Combat situations these days require AFVs to be quickly deployed and very manoeuverable, because urban fighting is the new front. The vehicle and personnel have to be under armour, but this cannot be achieved by regular steel armor. AFVs work in closed hatch operation, so they need early warning systems to detect hostility. Also the gun has to be smaller, to reduce weight. Elbit’s solution is the Unmanned Turret. It has several advantages over regular turrets, as used in tanks. The ammunition is stored on the roof and not in the vehicle, so there is a higher chance of survival in case of the vehicle was hit by an enemy. Also the turret uses no hull space, because it is mounted on top of the vehicle. The turret is equipped with dual axes stabilization systems and laser range finders. This weapon system should give a great advantage to infantry in modern warfare.

The third speaker presented Land Systems and Command, Control, Communication, Computers and Intelligence (C4I) systems. There are a lot of laser threats in the battlefield, for example laser designators, laser range finders and beam rider missiles. In order to detect these threats, Elbit produces detectors with a high dynamic range, using Si and GaAs. There are two systems available. the E-LAWS has four sensors (known as ‘quansors’) which can be placed on a turret. This system can detect the type of threat and the origin with a 1 degree resolution. The second system is the Laser TDS (Threat Detection System), a single mast solution which is smaller and cheaper, but has less capabilities.

From the military technology Elbit produces, sometimes spin-offs emerge into other area. The next presentation was about one of these spin-offs, BrightEye. Night-time driving produces a lot of accidents and casualties. Elbit used technology from military night vision in a system for the automotive industry. A laser is mounted in the headlight of a car and it detects differences in heat of objects in front of the car. This information is used to produce a night vision image, which is delivered to the driver via a head-up display.

The next presentation included a live demonstration of the VIPER: the Versatile, Intelligent, Portable Elbit Robot. It is a small robot that can manoeuver over rough terrain and carry all sorts of payload. It can be used to enter hostile environments, but it can also be used for civilian purposes, like finding missing persons inside a collapsed building and bomb detection.

Finally we received a presentation about the DARPA Grand Challenge. Elbit competed several times in this challenge, where autonomous robotic vehicles have to drive a difficult route, facing all kinds of challenges like traffic and obstacles. The knowledge gained in these challenges can be used in future unmanned, autonomous systems.

After an interesting and elaborate morning of presentations, it can be concluded that Elbit is a really versatile company with a high focus on electrical engineering. Although the main focus is to provide the military, especially the Israel Defense Forces, with a technological edge in the battlefield, the company also produces spin-offs in other areas, like the automotive and medical industry.

IAI/MBT Space Division

The next excursion of the day was to the MBT Space Division of the Israel Aerospace Industries (IAI). They are the prime contractor for all of the Israeli space projects, both military and civilian. The company has all the infrastructure for integrating, testing and ground control of satellites based on one campus. Currently, there are nine satellites in orbit and they are controlled from the site we visited. MBT Space has never had a launch failure and all the satellites in orbit are working properly.

For security reasons, military satellites are always launched from Israel, whereas commercial satellites can be launched from other countries. Because of the geographical position of Israel, with hostile countries on the east border, satellites must be launched westbound. This requires more energy because of the rotation of the earth. Therefore, MBT focuses on producing lightweight satellites.

The presentation continued by introducing several satellites MBT launched, like the EROS-family of satellites which produce high resolution images of the earth, and the TecSar, a satellite that uses Synthetic Aperture Radar to produces images through clouds. In 1998 MBT also launched a small satellite together with the Technion University, called the Techsat. This microsatellite was developed by students and has been in operation for many years.

Next up was a tour of the facilities. First we visited the integration and test center. Subsystems are designed elsewhere and integrated on this site. After integration, the satellites undergo extensive tests in vacuum chamber, acoustic testing et cetera. The second stop of the tour was the Ground Control. MBT also has a ground control station in Sweden. Because the range of a ground control station is limited to about 2,500 km, the satellite can only be reached from Israel four times a day. The satellite flies over the North Pole more often, so the station in Sweden can contact the satellite eleven times a day. Currently there was no control activity going on there, but a technician showed off interesting high resolution pictures of the pyramids in Cairo, a military airport in Japan, Jerusalem and a dam in Syria.

The companies we visited today really showed how the daily needs of the IDF are a great stimulus for the industry in Israel. It was interesting to see how a relatively small country like Israel has own satellite industry and is able to launch complex systems with a high success rate. Obviously this comes out of a need for military espionage intelligence. However, both Elbit and MBT also use their technology for peaceful civilian purposes, which gives more public support to the high government spending.

Tel Aviv University/Peres Center for Peace

In the evening we were welcomed at the Tel Aviv Universiy in The Iby and Aladar Fleischman Faculty of Engineering by professor Ehud Heyman, dean of the faculty and professor David Burshtein from the school of Electrical Engineering (EE). First we received a presentation on the faculty of Engineering. It was interesting to see there were a lot of Bachelor students who chose EE, more than Industrial Engineering and Mechanical Engineering. Sadly, this is not the case at the TU Delft.

This evening however, the reason of our visit was not Electrical Engineering. Representatives of the Peres Center for Peace introduced their work to us. The Peres Center for Peace is a non-governmental organization, working on a people to people basis to create a dialog between Palestinians and Israeli. Examples of projects are sports teams lead by a Israeli and Palestinian coach and a medical programme, where Pales-

tinian doctors work in Israel and take the acquired knowledge back to Palestine. The Peres Center for Peace also has an IT-department. They use instant messaging, games and blogging for communication between the two sides. Because the physical borders are hard to cross, the youth on both sides have little knowledge about each other. They can easily meet on-line. The organization also puts up Peace Computer Centers in underprivileged neighborhoods.

Another IT project the Center did was the Peacemaker Educational Program. An American gaming studio developed the game 'Peacemaker'. Through donations 100,000 copies were distributed to children on both sides. In the game you play as a leader of either side and you try to bring peace to the Middle East, by resolving the Palestinian-Israeli conflict. The game is based on real events and uses video and pictures. As a leader, you have a choice of a broad range of activities, like violence, reconstruction, politics and talking to the public. There are many groups of people who you have to please in order to solve the conflict. Children learn that there are many sides to the actions a leader or a nation takes and that it is hard to keep both sides happy. The main lesson is: 'If you want to deal with a partner, treat them like one'. Usually children who play the game resort to violence first, and then they see that only leads to further escalation. Interestingly, the Peres Center for Peace does not take a political standpoint on the conflict, but the game can only be won by creating a two state solution. However, this is not the underlying message of the game, as it also only touches the situation with the refugees and prisoners slightly. The main message is that both sides have different needs and view peace as something different. I believe showing there is a path to peace to children will really help to change their view on the situation.

The presentation was followed by an interesting discussion, which also included some students from the student union of the Tel Aviv University, who of course have served in the military themselves.

It was very interesting to see IT being used as a way to open the hearts and minds of people, especially with children who may have never seen a child from the other side. Dialogue on the level of regular people and children is needed to come to a solution, only politics and violence will probably never end the conflict. The Peres Center for Peace tries to make steps towards this.

Friday, November 14th, 2008

This day was scheduled as a 'day off in Tel Aviv.' In the week before departure, the committee arranged an excursion to the West Bank, one of the two Palestinian territories. Participation was not mandatory, and 19 of the 24 participants joined.

We left to Bethlehem in the morning. Because this ancient city is in Palestinian area, 10 kilometer south of Jerusalem, we first had to find a gate and cross it. Finding it, was not easy. After driving through some kind of no man's land, searching exits and phoning with the guide waiting in Bethlehem, we managed to find a gate without border control. Besides some zigzag obstacles and a large sign declaring that it is Palestinian area and Israeli are not allowed to pass, we were in Palestian area suddenly. During the day we learned the barrier has not yet been completed at this spot and will be soon. We headed on according to the GPS navigator and a few kilometers later an Israeli gate arised in a massive concrete wall. This is part of the 'Israeli West Bank Barrier', the 700 kilometer fence and wall system that separates Israeli and Palestinian areas. In an urban area like Jerusalem/Bethlehem it is constructed of impressive 9 meter high concrete sections, however most of it is made of three succeeding fences. Construction started in 2002. There is much to do about the barrier, even on its name: Israel calls it a 'security fence', the Palestinians 'Apartheidswall'.

Because of our Dutch nationality and Israeli license plates the Israeli soldiers allowed us to pass to Israel without hassle. The car insurance forbids driving in Palestine, so we parked the cars on the Israel side and pass the gate in reverse, walking. An extensive system exists, in which people who want to pass the gate have to identify themselves multiple times and explain the reason of their visits. If the soldiers dislike something or are moody, they can question you or ask you to undress. Fortunately, this does not apply to tourists.

We meet our first guide, Dutchman dr. Toine van Teeffelen. He married a Palestinian wife and has lived in Bethlehem for 12 years, and works at the Pax Christi affiliated Arab Educational Institute-Open Windows. He guided us along the wall which is painted with all kinds of graffiti protesting the massive concrete thing, to the house of a friend, surrounded by the wall on three sides. She told us about the huge impact of the wall on daily life and on her business, a souvenir shop. We visited the small shop and continued to Aida Refugee Camp, an overcrowded camp accommodating about 5,000 Palestinians near Bethlehem. In the 1950 established camp lots of shabby houses and has limited infrastructure. We talked to several inhabitants while a boy in a BMW tried to divert us. It's difficult to describe the conflict in a few lines, but it can be said that it is deeply rooted and will not be easy to solve, although everybody sees the need for a solution.

After a change of guides, Toine left the group, we went to the Al-Rowwad Culture and Theatre Training Centre. This Centre was located in the refugee camp. The people at Al-Rowwad attempt to provide a healthy environment to help relieve some of the stress of living in war conditions for children in the camp. Various projects, national and international, are performed to achieve this. One of the theatre groups has performed in Sweden, Denmark, France, Egypt, Belgium and USA, to promote non-violent resistance. Unfortunately there was no show that day, but some youth of our age was gathered and working on some projects.

Time for lunch! A 'sherut' (shared taxi van) drove us to the center of Bethlehem and we had a very pleasant and cheap meal at a local falafel restaurant. Ate showed his unique skills by making a falafel ball. We continued to the Church of the Nativity, a complex of two churches built on the place Christians and certain Muslims believe Jesus was born. After passing the very low Door of Humility we saw a mosaic floor from the 4th century. A long queue was waiting to visit the Grotto of the

Nativity, we omitted it. We also visited the place Hieronymus (Saint Jerome) has translated the bible in Latin. The Christian guide told with enthusiasm about it. We had also the oppurtunity to have a view of an Israeli settlement, which was in big contrast with the Palestinian environment.

After a little walk, we arrived at one of the houses of the Pax Christi community. As mentioned, the Arab Educational Institute works together with Pax Christi. We had another meeting with some students of our own age and an interesting discussion on various aspects of the conflict begun. The Palestinians trying to bias us from the Western Israeli point of view to their point of view. Again events reflect themselves in language in different ways: the 1948 fights are called al Nakba (the catastrophe) in Arabic and Independence War by Israeli. It can be said there is not much understanding for opinions from the Israeli side of the wall, which seems not surprising due to the things these Palestinians had suffered and still suffer.

It was time to head to Israel and to Tel Aviv. It was growing dark and we passed the gate smoothly. In the evening we had a collective dinner with all participants, professor Hellendoorn and professor Ligthart and his wife. The former accompanied us next week, like the Ligtharts did the week before. After having a great meal that combined both Israeli and Western food, we dispersed in the city for a drink.

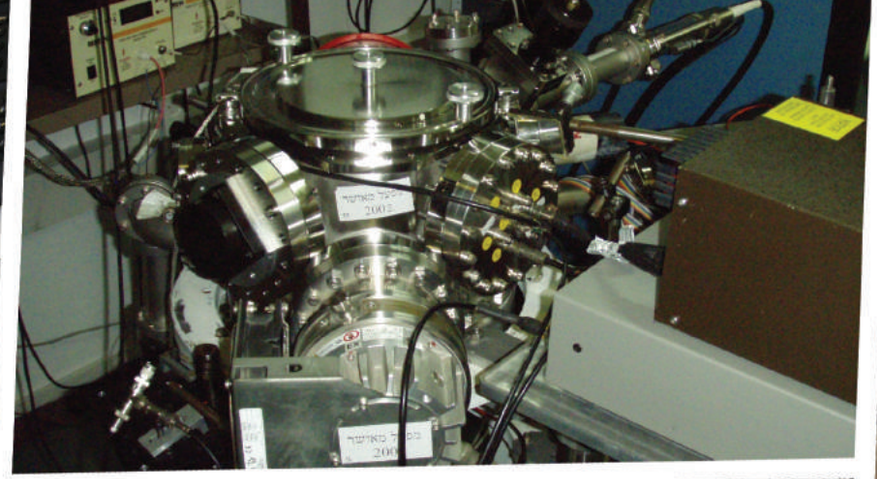
Saturday, November 15th, 2008

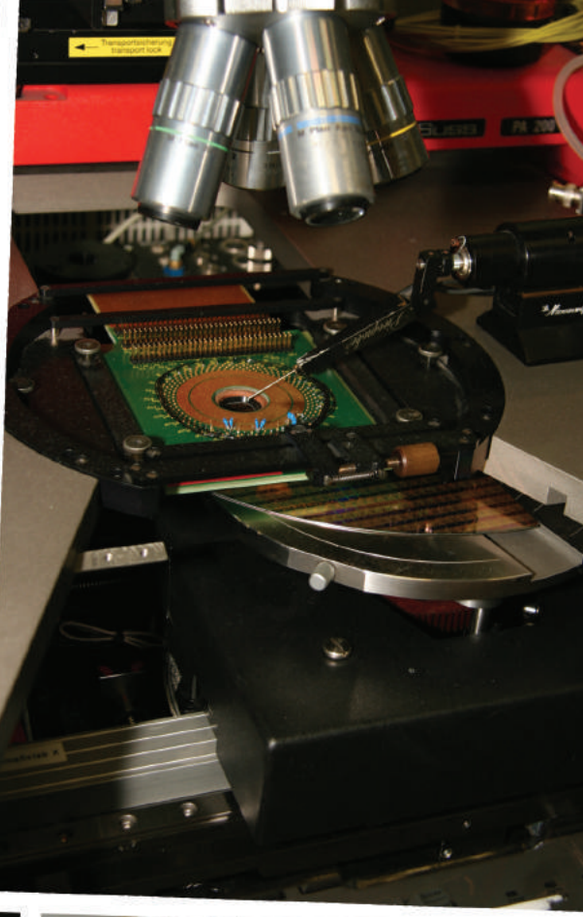
Today there were no company visits planned, but a cultural excursion to the lowest point of the earth: the Dead Sea. The trip through the Negev Desert was long, but the first sight of the Dead Sea made it all worth it. Before taking a dive in the salty pool, we paid a visit to Masada.

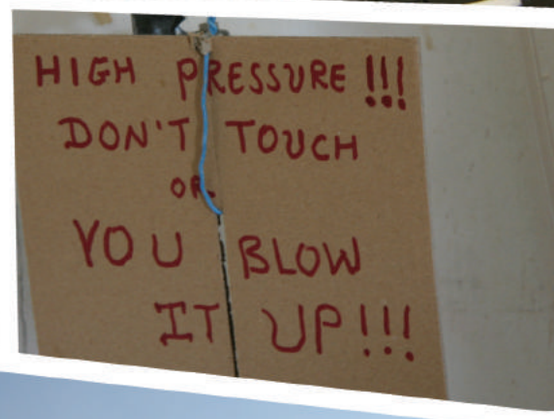
Masada is a UNESCO World Heritage site, located in the south of Israel. The name is derived from the Hebrew word for fortress. Herod the Great built a refuge for himself at this point. The fortress is a mountain top with steep cliff on all sides. The natural approach to this top is very hard. After the destruction of the Temple by the Romans in the year 70 AD, the Jews fled Jerusalem and sought refuge at Masada. There, they were under siege by the Romans. They managed to stop the Roman attacks for quite a while, but in the end the Romans breached the defense. When they entered the stronghold, the Romans found that the inhabitants had chosen mass suicide over being captured by the Romans.

Today, there are nicely presented excavations on top of the mountain. Also, there is a cable car system to the top. Because we did not want to spend too much time tiring ourselves climbing up the Snail Path, we took this route. Masada provides a great view over the Dead Sea, so many pictures were taken.

After Masada, we had the opportunity to take a dive in the Dead Sea. Everybody knows that because of the high concentration of salt (over 30%), there is no life in the Dead Sea, hence the name. Also, it is easier to float. But if you have never been in the water, the feeling of floating much higher than usually in a sea, is hard to describe. So, we could end the day relaxing on the beach and floating in the water. Of course the traditional picture of a man reading while floating in the Dead Sea was made, only this time with a Study Tour detail: we were reading the preliminary report.






HIGH PRESSURE !!!
DON'T TOUCH
OR
YOU BLOW
IT UP!!!

Sunday, November 16th, 2008

We had been in Israel for almost 9 days by now. The time had come to send my friends and family a postcard. That is why I left the hostel early in the morning to go to the post office. By global convention it was crowded in the post office and I had to take a number and wait. That is why I was not only too late for the first counting game of the day, I also had to miss a historical event: the first participant to loose his blue “Deelnemersboekje”(participants booklet) received a pink failure booklet.

After picking up Professor Hellendoorn we went to El-Mul where we were welcomed by R&D manager Dr. Oren Zarchin. Het told us about El-Mul, which, since it’s founding in 1992, develops detectors and devices for semiconductor manufacturers. The next presentation explained how Detectors for Scanning Electron Microscopy operates. Using some graphs and pictures the concepts of backscattering and scanning were explained to us, along with the advantages of Low Voltage Scanning Electron Microscopy. In automatic detection, for example used in wafer productions, faster scans are better. This means however there are less electrons per pixel.

In the past El-Mul was a manufacturer of detectors for microscopes only. Because the quality of the electron beam has great influence on the quality of the picture, they decided to broaden their field to include electron sources as well. Nano tubes have great properties that can be used as electron beams. Electron beams can be used in microscopes, but may also be applied in an array to be part of a flat panel screen. Another application is the ionization of gasses.

The next presentation dealt with Wetsem©, a technology El-Mul acquired by the acquisition of Quantomix. After this presentation we had a tour around the facilities. We saw a man using Matlab to project the traject of an electron. Another guy was watching to a small television screen to check the detector of the microscope. Our guide explained us the previous, bigger television was burned the week before.

After the tour we went to the second company of the day, Orbotech. A young lady provided us with visitor badges and introduced the program to us. After this the Corporate Director of Marketing and Communications introduced us to Orbotech. Due to her Belgium background, she was able to speak Dutch, but she’s used to give her presentation in English and prefers to speak to us in English as well.

Although a lot of people never heard of Orbotech before, she tells us almost every electronic device in the world is built using Orbotech systems. Orbotech designs, develops, manufactures, markets and services automated optical inspection (AOI) systems for bare and assembled PCBs, FPDs, and imaging solutions for PCB production.

As by her words, Orbotech has a history of 27 years of technological breaktrough. It is therefore no supprise that at least one fourth of the companies employees are working on R&D. Research is done in the United States of America and in Europe, but the main part of research is done in Israel. Their strategy is as well simple as ambitious, to be the leader in an industry, or not to go in to the industry at all.

After this introduction our group split up and was guided around the facilities. We were shown machines which are able to test screen panels of the 8th generation. During our tour some people are working on assembling new machines. The raw materials for the machines are delivered to a warehouse nearby, after which the machines are assembled on site. The next machine will be able to test screen panels of the 10th generation and weighs 20 tons. These machines are used by companies for yield management, or to manage the number of defects within a production batch.

Direct Imaging is a technology that is replacing plotting in the manufacturing of PCBs. Orbotech manufactures machines that check these boards optically for defects. A new machine is also able to fix the defects. A challenge for Orbotech is to convince their costumers they need this new technology. After some other laboratories we finish in the repair department. Orbotech supports their machines up to 20 years after sale. 25% of the turnover is created by the repair department.

After a very nice lunch we went return to the reception hall for a presentation. A member of the research group for developments explains to us how Graphical Processing Units (GPUs) can be used for faster computations. This kind of research is done to incorporate new technologies in other departments of Orbotech.

The last company of the day is situated in a small building in the middle of the city. After an almost infinite number of stairs we arrive in a neat but small room. Because the reception room is too small to fit our group, we are seated in a normal office in which all the tables are moved to the side. On one of the table stands a dish of cookies, which are consumed by the neighbouring students and two bottles of what seems to be coke.

Thomas Cohn introduced us to the CEO of Mantis Vision, Amimai Loven. Mantis Vision develops technology to capture 3D pictures. A few years ago this company had only a few employees, nowadays they are heading towards 30 people. The CEO told us the company started without money, equipment or even a plan, but the starters did have an idea, determination and, most of all, nothing to lose. He showed us a short movie about their product.

The government of Israel established a contact between the US Government and Mantis Vision. Because the technology can be used for security applications an forensic applications, the US government was interested and the company was founded in April 2005.

Different techniques to create 3D images were discussed. They all have several problems. Not all of them have sufficient accuracy, or are not dynamic. This means only pictures without movements can be created. Therefore Mantis Visions uses Bidimensional coding. Using this technique a pattern is projected on the objects. Because this pattern is unique in one dimension, the location in the other dimension can be used to calculate the third dimension.

A scientist of the Optical Research Laboratories interrupted our meeting. In his presentation he told us about some techniques which are slightly related to our previous objects. Examples are restoring the quality of poor images using a-priori information, or listening using a laser shining on a window and a camera.

After the professor left, we took a small break, during which one of the bottles is determined to contain something different than coke. Although the group disagrees about whether this is beer without alcohol, we agreed on disliking the liquid.

The presentation about bidimensional coding continued after the break. Like it was the still picture which enabled the invention of the moving pictures, the still 3D picture will enable the usage of real captures to be used in computer games and 3D movies. The day had come to an end and the President of the Study Tour Committee offered the last presents of the day, after which we head to Tel-Aviv for the last time.

Monday, November 17th, 2008

After one week the employees of our Hostel, Hayarkon 48, had finally discovered the members of our group preferred to drink beer from Israel, Goldstar, instead of Carlsberg, during our long evenings at the bar/reception combination, or on the roof. This had resulted in the allocation of more space for Goldstar in the fridge, to the detriment of Carlsberg. This reallocation only lasted one day, after which Hayarkon 48 was out of Goldstar, something not uncustomary in Israel.

Entirely unrelated to the beer incident we had to stand up early in the morning to pack our stuff and leave the place we had called home for over a week. After placing our suitcases in the car we had half an hour to spare before professor Hellendoorn would expect us at his hotel. Luckily the mobile phone we had so far been using as a car navigation system, could easily function as an entertainment system. We took our chances and watched an episode of Southpark before picking up Professor Hellendoorn and leaving for Scopus.

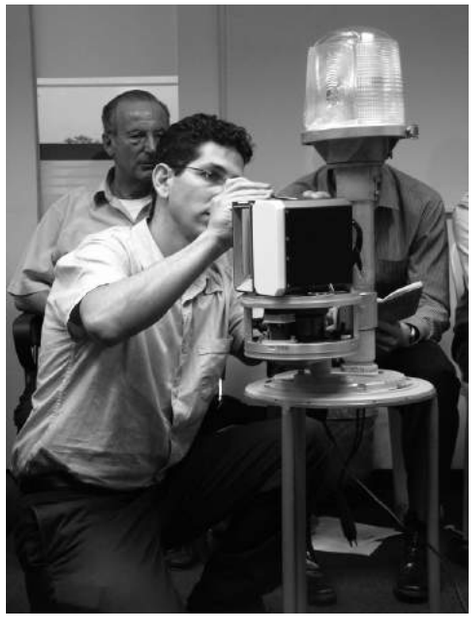
Scopus welcomed us with a company overview presented by an employee of the sales department. He told us Scopus has more than 20 years of experience in video compression. In the past this technology was used in military and space applications, but nowadays they are commercially available. Scopus delivers the means for source coding, video processing and IP-based management of video streams. Since all countries of the EU will cease broadcasting of analogous television signals in the ether before 2012, a lot of bandwidth will become available for digital video broadcasting. The equipment used for broadcasting this digital streams is provided by Scopus. Several standards are used in this area, like DVB-T/C/S2, MPEG4 etc. Scopus awaits for the market to form standards and does not take a leading role in the adaption of new standards.

The second presentation concerned the IRD-2900 product line. This device receives, descrambles, processes and decodes video streams.

The third presenter is an employee of the marketing department. David Shamir told us about the benefits of digital television for consumers and producers, and the need for compression. He also explained how this compression is realised. After explaining the difference between variable bitrate encoding (VBR) and its constant counter-

part, he told us CBR is almost never used. It was tried in Sri Lanka, but the quality was too bad.

After the fourth presentation, which told us all we wanted to know and more about the IVG-7000 product line, we got a tour around the lab. In the lab we saw a lot of boxes the previous presenters talked about. In this lab customer situations are simulated as to provide support for cable providers and broadcasting stations. The used encoders can encode up to 4 MPEG2 or MPEG4 channels, but cost up to 15,000 euros each. Our President thanked everybody for their time and efforts with the usual gifts and we head to the second company of the day.



XSight welcomed us with a lunch which meets the high standards we had grown accustom to. After this we sat down in a meeting room where we received a keychain in the form of a hex nut. While the beamer welcomed a group from Delpht, Thomas Cohn told us he has been involved with the company when it had only two employees, while today the companies pays the salaries of 28 people.

Because the CEO had a meeting with a client, the first presentation is presented by the CEO of DOCOR International Management, a subsidiary of the Van Leer Group Foundation. The origins of the Van Leer activities lie with Bernard Van Leer, a Dutch industrialist and philanthropist. Dr. Alon Dumanis told us about the Van Leer foundation which has a policy to return its benefits to society. This is accomplished in founding activities in which children are involved. Another involvement of Van Leer is their contribution to the management of the start-up companies they invest in. This is done because a lot of companies with good technologies go bankrupt, due to the lack of good managers.

In his second presentation he explained why Israel is one of the leading countries in technology. A lot of companies use technologies developed in the military, but are used for civil applications like medicine nowadays. After some other examples of start-ups which are financed by DOCOR, Dr. Meny Benady starts his presentation.

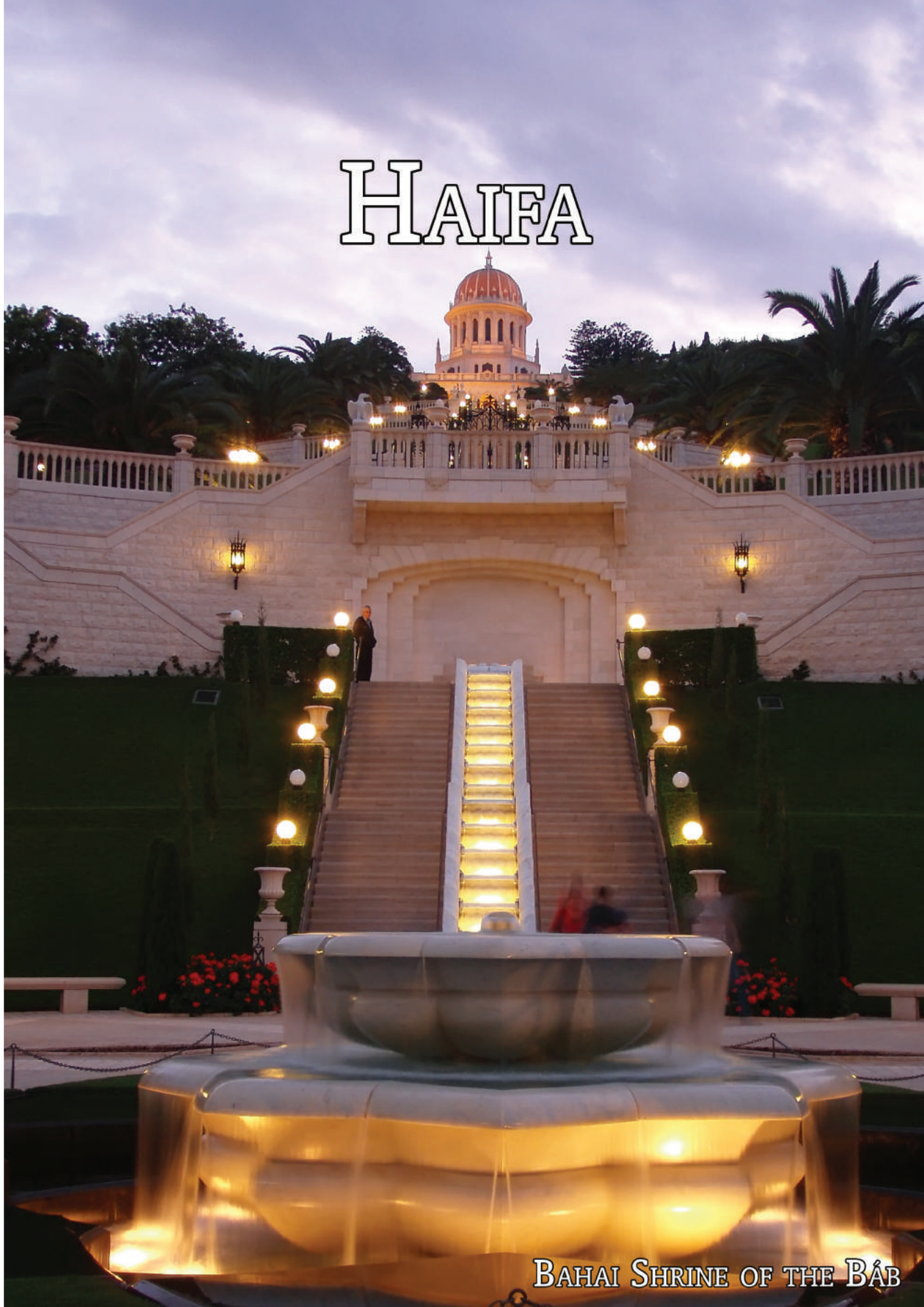
XSight developed the FODetect System. FOD stands for Foreign Object Debris, a name for everything which does not belong on the runway of airports, like a hex nut in the form of our keychains. Benady showed us a strip of metal. A piece of metal like this was responsible for a crash with a Concorde in 2000. A lot of other examples of accidents caused by FODs were given, along with an estimation that FOD's are responsible for damage costs of $4 billion.

The conventional methods to detect FODs are not accurate, expensive, or even a combination of both. They include a big group of people walking side by side over the runway. "You could have a disco party on the runway and they would not even know". The solution to this problem would be to place many sensors on both tides of the runway. If these sensors detect a FOD they can show a visual of the suspicious area, thus someone can confirm or neglect the detection. These sensors are developed by XSight. The scanner uses visual sight as well as radar, and deploys a laser beam to show where the debris can be found.

After some more explanation of the sensors we got a live demo using a sensor in Boston. After some problems, an employee showed us the visual of a sensor on a runway. The remote connection can be used to turn and zoom the camera of the sensor.

The last presentation of the day is held by the developer Aviv Goner. He showed us one of the sensors and explains which problems were encountered during the development, for example cause by the small space in the equipment. He also explained the working of the radar used in the sensor. To protect the sensor it is equipped with a wiper to wipe away raindrops, and has a door which can be shut during extreme weather conditions like storm. The sensor was developed to work 24 hours a day, al year long during less extreme circumstances.

It has been a long day and Tamar gave the usual gifts to the people at XSight. The presenters thanked us for our attention, and we left for Haifa to grab a dinner, which would prove to be not as easy as we were used to in Tel Aviv.



Tuesday, November 18th 2008

This morning we were able to catch up on some much-needed sleep. After over a week of travelling, getting up early and going to sleep late most of us were pretty worn out. Philips Healthcare, the excursion planned for this morning, cancelled at the last minute. It is a shame not to be able to see Philips in Israel, but apparently something really important came up.

In the afternoon we went to the Intel Israel Development Center on the Matam High-tech park. Intel was founded in the USA in 1968, Intel Israel was founded in 1974. Gabi Loebl gave a presentation about the history of the computer, microprocessor and the internet. Right now, Intel is working on integrating the graphics and memory controller in the processor. In 2010 they expect to introduce the first 32nm processor. Although the contents of the presentation was very basic, it was interesting to learn how much Intel research is done in Israel. When we were asked: "Do you know what a megahertz is?", one of us added at least some depth to counter the question with a remark about the length of the pipeline stage in the Intel Pentium IV processor.

After the presentation, we received a tour by Ruth Bonet, manager of the Validation Labs. She said: "The world is divided, you either are pre-silicon or post-silicon". The Validation Labs are post-silicon. 100 people are working on 4000 m^2 of lab space, with about $100B of machines. After the design of a chip is completed and before it is ready to go into high volume manufacturing, the chip goes to Ms. Bonet's lab. They characterize the processor, to test to what specifications the chip performs in silicon. Also, they provided test programs for high volume manufacturing.

The first step in the validation process is classification of the chip, based on frequency, power usage and leakage. The second step is to burn in the processor in an oven at 110 degrees Celsius to simulate ageing. The third step is to test the chip on a customer reference board. In this step the processor is tested logically, with several test programs, to mimic real usage of the chip. The processor should undergo these tests without failure. When the chip goes into high volume manufacturing, for example in Malaysia, this whole process should be really fast. Therefore, in Israel they try to speed up the process as much as possible and cut out the human factor by automating the process.

Every third Tuesday of the month, the active members of the ETV gather in a small café called the 'Kobus Kuch' in Delft for a social drink. Because most of the active ETV members joined the Study Tour, it was impossible to do the traditional Kobus drink in Delft. Luckily, we had the entire Kobus committee with us on the tour. Research done in the days before showed that an excellent replacement could be found just across the street from our hostel. So this night the Kobus International was hosted at Eli's Pub.

The committee managed to make a poster for the drink. Apparently this promotion was very successful, because we were all present that night. It was Hugo's birthday, so he received a cake with candles. The bar personnel had to be trained in some specific ETV usages like "Handen voor bier" (show hands for beer), but as a surrogate Kobus, Eli's Pub performed well.

Wednesday, November 19th 2008

The twelfth day in Israel is devoted to the renowned Technion University and one of its high-tech startups. Technion is located in Technion City, Haifa and is about 20 minutes driving from the Port Inn hostel.

At half past nine we report at the 'Technion – Israel Institute of Technology Visitors Center.' A not very well-tempered student of civil engineering guides us through the center, pointing at various things the 1924 found Technion has achieved. The faculty of Electrical Engineering houses the most students, about 1650 BSc and 400 graduates out of 12,000 (BSc, MSc, PhD). The institute awarded near 84,000 degrees since 1927 and most managers in Israeli high tech industries hold one. The faculty of Aerospace seemed to be the most important one and lots of research activities have to do with aircraft and weapon industries.

An unique feature of the Technion is their Faculty of Medicine, just a hand full of technical universities have one. One of the things achieved is the LZW compression algorithm, another achievement is the 2004 Nobel Prize in Chemistry for the discovery of the crucial role of ubiquitin in the process of protein breakdown in cells, awarded to two professors at the Faculty of Medicine. We continue with a campus tour.
At eleven o'clock professor Gadi Eisenstein welcomes us at the Electrical Engineering department and introduces it. The undergraduate program lasts four years, and part of the students take a very tough "double degree" program: they are educated in electrical engineering and either physics or computer science. In the fourth year, every student participates in an one or two semester "student project activity", of which 15-20% is in cooperation with high-tech industry. Most projects are supervised by either MSc or PhD students, and some of them participate in national or international competitions.

The faculty consists of eighteen laboratories, divided in three categories: electronics, computers and communications. According to an independent review (2000) the faculty is in the worldwide top ten, both in research and education. A major portion of the laboratories cooperates with industry and guides students in the student projects. People in the faculty also organize half-day or one day workshops on request of industry.

Associate professor Moshe Nazarathy continues, and provides an overview of the fourteen courses in the communication section. Some faculty members came from industry where they set up companies. The faculty is renowned in their information theory research, lots of their fundamental research results are soon applied in industry.

Israel Cohen, associate professor, gives a talk about research and education in signal processing area. This field is split up in four main areas, most of them he treats with examples:

- Speech and audio processing: removing of background noise when using speech dialing in a car; removing echoes if someone is not next to the microphone.
- Image processing: detection of a mine on the seabed, is difficult since seabeds change continuously over time and space. He also gives a second example on the scanning of images. If you scan a page printed on both sides, the back side often reflects on the front side. If you scan both pages and do clever manipulation, you can separate both images.
- Video processing, e.g. video coding and compression, object recognition and tracking.
- Real time DSP, for instance digital watermarking.
- Faculty members mainly work on the theoretical aspects and have it implemented by undergraduate students.

Finally, before lunch, we visited two laboratories. Due to time and space constrains, the group was divided in two and visited either the Signal and Image Processing Laboratory with Peleg Nimrod, or the Communication Laboratory, like me.

The latter has been set up for antennae, transmission and reception at radio frequencies, signal processing for transmission and reception, advanced digital design and realisation of signal processing algorithms. Namer Moshe explains how students created a device the industry did not have yet: a radio frequency hardware simulator for mimo and ultra-wideband (UWB) communication channels, basically a unique tool that replicates in hardware the models of communication channels of both UWB and actual environment encountered by mimo systems.

We have a light lunch with a baguette and drinks. The following item on the schedule is a visit to the optoelectronics. A short course on joining glass fibres follows, we see the process of stripping the outer shell of both ends, aligning them in a special apparatus and joining them by some electric arcing. The resulting joint has a resistance of about 0.3 dB and is invisible to human eye.

At 13.30 professor Joseph Salzman tells us about the Microelectronics Research Center he heads, and the Nano-Electronics Center which is partly joined to it. The clean room facilities are, besides of research and industry collaboration, used to have BSc students gather some hands on experience in producing chips. They design a simple circuit and produce it themselves in the facility. To quote Salzman: “The role of students is to break machines, the role of the professors is to fix them.” He also explains a major difference between micro and nano scale. The former is manufactured using a top-down process applied in industrial scale nowadays, the latter uses a bottom-up approach of which the manufacturability has not yet been ‘solved.’

A tour to both centers follows. Compared to current fabs, the machines seemed a bit out-dated. Part of it was an introduction to the principle of an atomic force microscope. The visit closes with a coffee party with a couple of Technion EE students. One of the many differences is their age: some of them are married and most of them are about 27-34 years old due to army service.

We head on to Argo Medical Technologies at the nearby Matam technology park nearby, a high tech start-up which develops an exoskeleton. Their “wearable, motorized quasi-robotic suit,” called ReWalk, makes it possible to people with severe walking impairments to stand, walk and climb stairs. The company was founded in 2001 under the Technion Seed umbrella, a partnership between four venture capitalists to develop ideas into viable companies.

The partly paralysed Rani gives us an impressive live demo in front of the office. He shows us how he can walk, sit, stand and climb stairs with the ReWalk and two crutches. It does not go very quickly, but it was never intended to do so. The user carries a backpack with a sophisticated computer and a battery pack and wears a control pad at one of his arms. When walking, a movement sensor on the shoulder detects the next step. The 20 kg although is controlled with some buttons in a case on the wrist. Overall, despite the movement is noisy and not very smooth, it is impressive to see a person, paralysed below his hips, walking again.

Being able to stand and walk offers huge advantages over using a wheelchair all the time. It improves physical health as well as mental health e.g. self esteem, dignity and quality of life. Long-term wheel chair use often causes serious problems with the urinary, respiratory, cardiovascular and digestive systems and osteoporosis, and pressure sores. The suit, which can partly be put under clothes eventually, thus prevents thousands of Euro’s being spent on healthcare annually.

It’s not yet possible to buy a ReWalk, the device has to be certified first by US and EU governments. Next year (2009) five prototypes will be tested in two hospitals. Future developments include suitability to children below 12, a decrease in size which enables it to put it under your clothes, and easier control.

Satisfied and saturated, we leave to the hostel close to six o’clock.


ELI'S PUB
LIVE MUSIC BAR
ELI'S PUB
LIVE MUSIC BAR
MURPHYS
IRISH STOUT
PUB


GOLDSTAR
DARK LAGER
BEER

Thursday, November 20th, 2008

Today was the last day of company visits, but with two micro-electronic companies scheduled, it was a really interesting day.

Saifun Semiconductors

First we went to Saifun Semiconductors. Roy Naveh, Serial Flash manager at Saifun started a presentation about the company, before he went into the more technical details. Saifun was founded in 1997 and was the most profitable semiconductor company in 2005 and 2006. Their mission is to be the leading IP provider to the non-volatile memory market. They have over 150 patents issued and pending and 79% of the employees are working in R&D. In 2008 Saifun merged with Spansion, a much larger company. Spansion also has fabrication facilities, so the merger means an integration of the development and production chain.

The market for non-volatile memory is segmented into integrated and removable memory. Integrated memory is both used for code and data storage, it has to be reliable and fast readable. In removable memory the price per gigabit is the key attribute, because it is mostly used for data storage. The write speed is more important in this segment. The market size of memory is $23.3B in 2005 and expected to grow to $52.8B in 2010.

After the introduction to the company, the presentation moved to the technology of non-volatile memory (NVM). The main concept of NVM is a transistor with a floating gate under a control gate. The control gate can trap a charge in the floating gate. Whether a current flows through the transistor, depends on the amount of charge in the floating gate. The charge in the floating gate can be added with a positive charge on the control gate, and erased by applying a negative charge. This way a 0 or an 1 can be stored, creating a 1-bit memory. Shrinkage of technology provided an enormous growth, the capacity of memory chips per surface area increased 4,000,000 times in 35 years. However, the tunnel oxide under the gate only shrunk from 10 nm to 8 nm, in 26 years. It is proven that trapping cannot be scaled down any further. Another way to store more bits is needed to further increase the capacity.

The Saifun has developed a NROM technique which has two spaces where charge can be stored in a nitrated layer, thus having two bits. This is called the Mirrorbit. Also, there is a fabrication technique which enables two bits to be trapped in a two level floating gate, basically stacking the bits. If these two techniques are combined, like Saifun did, a total of 4 bits can be stacked on one transistor device.

The supply voltage of memory chips went down from 5V to 1.8V in current technology, or even lower. However, higher voltages are needed on the chip to perform the operation. Therefore charge pumps are used on the chip.

Saifun does research and tries to patent it. They make money from licensing patents to other companies, who use them to fabricate memory. Because of the merger with Spansion, who has a big legal department, there is more legal force. Recently they sued Samsung for $30 billion for patent violations.

After the presentation we got a tour through their laboratory and R&D offices. Saifun is a really technology driven, research oriented company. The presentation we received had an excellent mix between hardcore technology and information about the company and the market. It was an excellent excursion.

Given Imaging

After the lunch, we visited another high tech start-up, called Given Imaging. The name ‘Given’ comes from Gastro Internal Video ENdoscopy. It was founded in 1998 and emerged from Rafael, where the founder worked on smart missiles with camera target seeking capabilities. The company had a hard beginning. The idea originated in the beginning of the nineties, but the technology was not ready until the end of the century. Now, they are the leader in the market for video capsule endoscopy. The company has a razor/razor-blade business model, which means they sell the computer and system relatively cheap, and get most (83%) of the revenue from selling of the capsules.

The goal is to deliver a digestive system which can film the entire system, from mouth to end. Because of the length of the system and the nonlinearity in the amount of time the digestion takes, Given offers several different video pill cams.

The first product they developed was a wireless video capsule extracting images from the oesophagus and the stomach. Doctors were unable to reach this area with colonoscopy techniques. Therefore, there was no competition on this market.

After that the pillcam ESO for the oesophagus was developed. The pillcam stays in the stomach and small intestines for up to four hours, it takes less then 30 seconds after being swallowed to pass the oesophagus. Orientation of the pill is not always the same, so this product has a camera on both sides.

The third pillcam is for the colon. The challenge in this region is that it can take up to several days to pass this region, so battery life is an issue. Where the other pillcams have a higher frame rate, this product only has a frame rate of 2-4 frames per second.

Finally, the company now has a product under test to check whether the capsule can pass the entire system. It dissolves in 30-40 hours, so when it is stuck somewhere, no damage is done, unlike the pillcams.

There is a great future market for these products, to include more options like medicine delivery, to move away from screening to treating. The goal is also to shorten the time the doctor has to watch the movie, using video recognition. Right now, the doctor has to watch about 30 minutes of film, the goal is to shorten this to 15 minutes in order to compete with other imaging techniques. The pillcam will always give better images, but the time of the doctor is a really important factor for insurance company reimbursement.

The products made by this company will increase the efficiency of screening and decrease the mortality rate caused by cancer in the digestive system. Also, the system is much less intrusive and painful than regular imaging techniques.

Friday, November 21st, 2008

This day was supposed to be a day off. Two weeks in seemed to be far too short to visit every noteworthy place in Israel. During our tour through Jerusalem our touring guide had invited us to come to her kibbutz, near the border with Jordan. The committee had evaluated this invitation and decided that our free day in Haifa would be the best day to go with one or more of our vans to visit the kibbutz with everyone who was interested.

Because we would not leave before 10.30 am, a lot of the participants had taken their chance to drink all the Goldstar in one pub and then go to the Ciy Hall discotheque to party. That is why at our departure not everybody was entirely awake yet, but still a total number of eighteen persons managed to get out of bed in time to take this unique chance. The road to the kibbutz was a little bit longer than the 30 minutes that were promised, but proved to be worth the effort. Our touring guide Rina welcomed us at her kibbutz. She explained about the nature of a kibbutz in general and her kibbutz, which was founded in 1936, especially. Roughly 500 people lived in this kibbutz, while around 150 people were members of the kibbutz.

In the years after the foundation the principles of the kibbutz were much stronger. Most of the properties belonged to the community and children grew up together in children houses. During the decennia that followed a lot of the old principles became more or less obsolete. Parents wanted to take care of their own children and the children houses became abolished. Couples were given a budget depending on their needs. Years later the members decided it was unfair that people who work more received the same amount of money as others. Therefore the kibbutz decided to let the members keep 20% of their earnings. On the day we were in the kibbutz an election was going on about the question to cancel all communal property. Rina however did not expect the supporters would get the two third majority required for this drastic change.

Rina showed us around. The kibbutz is like a bungalow parc, with a place to have dinner with each other, a variety of houses and playground for the children. A lot of old people, up to 100 years old, lived in the kibbutz. Through the kibbutz a small but clear river flowed, which added to the picturesque character of the place.

Rina encouraged us to eat the cumquats and grapefruits which grew on trees. At last she told us a place where we could swim.

After departing from Rina, we went to the river. The water proved to be nice and the waterfalls and palm trees made clear why Rina called the place paradise. We swam in the river and played with the ETV beach ball for a while. After this we bought some ice cream and drove back to Haifa.

It had been 3.00 pm already. Since Sabbath starts Fridays at sunset, most stores were unfortunately already closed. Since this was our last free day a lot of us did not get the chance to buy lunch for the next day or buy some souvenirs for friends and relatives. We did however have a wonderful day in a peaceful place most of us never get the chance to visit.

Saturday, November 22nd 2008

After some of us had a joyful night at the Luna night club, we leave ten minutes late at 08.55 am for sightseeing in the north of Israel. We drove 1½ hour to Mitzpe Quneitra, a viewpoint where whe should see the deserted town of Quneitra in the unoccupied disengagement zone between Israel and Syria. Due to Sabbath it was closed, disappointing most of us. The committee's Lonely Planet guide warned us the region was not very interesting at all, and it seemed to be true. The foggy and rainy weather did not help to reject this opinion. Luckily the route through the mountains near Tiberias cancelled this out: the region is quite green, with a lot of fields full of stones, grasses, some trees and bushes. We have several fairy tale views on the Sea of Galilee, astonishing, while driving to the red-domed Greek Orthodox Church of the Seven Apostles (1931) near the ancient village of Capernaum, a small and charming church built next to the Sea. Inside are colourful paintings of several bible stories.

The visit continued to Capernaum visitors center. Excavations of a fishing village with a synagogue and church show up, marking the place Peter was believed to have lived and Jesus supposedly cured many who were suffering from diseases. Since everybody was getting hungry, we decided to find some restaurant to have lunch. Since we were near the Sea of Galilee, some of us decided to get a St. Peter's fish, a kind of tilapia. The cosiness compensates the afterwards moderate food. Professor Hellendoorn decided his employer will sponsor the lunch, and the waiter celebrated this by providing him a chair in the middle, a cup of coffee and a cigarette spontaneously.

Next stop on the way back to Haifa is Nazareth, nowadays a city with a largely Arab population, which results in shops open on this Sabbath. The streets are overcrowded with cars, it took quite some time to find a car park, especially when you miss an entry. We decided to take some time to visit the Basilica of the Annunciation, the 1969 roman catholic church built on the place it is believed the angel Gabriel announced that she would conceive the son of God. The extensive building consists of an upper church and lower church, the latter built around a grotto believed

to be Mary's childhood home. Inside and outside the upper church a gallery of collages, mosaics and paintings of Mary is shown, each donated by a country and representing a different style of Christian art, it provides an interesting overview. Some made a flying stop at a souvenir shop, and we continued to Haifa.

Some hours later we had the final collective dinner with all participants, professor Hellendoorn, advisor Thomas Cohn and his wife, Sabine, and special guest professor Kupferschmidt and his wife. Uri Kupferschmidt is a Dutchman from the faculty of humanities at the University of Haifa and has been correspondent in the Middle East for many years. During the tasty dinner he told us about the complicated society Israel is and has been for many years. He provided many examples some of which has been discussed extensively. It showed again two weeks are way too short to understand a society. Tamar thanked Kupferschmidt, Cohn and Hellendoorn with the Delft blue earthenware plate. On behalf of all participants, Ate thanked the committee for organising this great trip with a replacement of the "stressfles" (bottle of liquor the committee took along from Delft, not to be opened unless a serious issue happens), because it disappeared from the hostel some days earlier.

When arriving back at the Port Inn hostel, midnight has passed and almost every participant decided to give nearby Eli's Pub one last try, to celebrate the end of a very succesful Study Tour.

Sunday, November 23th 2008

After a rainy Saturday evening, the sun was shining again today. However, it still was a sad day, because it was the last day of the study tour. In the morning everybody checked out of the hostel. The diary committee managed to create and copy a questionnaire about the study tour, so we had something to do in the airplane.

After a short drive, we arrived at the airport. We managed to go through the security quite easily, although we were amazed when the Technion information folder was thoroughly read by the security. Again we flew via Zürich, however due to heavy snowfall our plane was delayed. While waiting at the airport we heard flights to Brussels and Luxembourg were being cancelled, so we were lucky to even get home. Around midnight we arrived at Schiphol Airport, where did our last counting game. Of course, this failed again, miserably. In order to ease out of the hectic schedule of the two weeks, some precautionary shots of Arack were taken by the ones who brought the Israeli treat home. we said our goodbyes to each other and reunited with family and girlfriends, looking back on two great weeks and most definitely wiser and more experienced than when we left for our journey two weeks before.

Part 4
Companies
&
Institutes

Haifa by night

Table of Companies and Institutes

Argo Medical Systems Ltd.

Founded:	2001
Headquarters:	Haifa, Israel
Employees:	8
Research labs:	Haifa
Products:	ReWalk™ is a wearable, motorized quasi robotic suit. Partially concealable under clothing, ReWalk provides user-initiated mobility - leveraging advanced motion sensors, sophisticated robotic control algorithms, on-board computers, real-time software, actuation motors, tailored rechargeable batteries and composite materials.
Website:	http://www.argomedtec.com
Internship/career:	info@argomedtec.com

Elbit Systems Ltd.

Founded:	1967
Headquarters:	Haifa, Israel
Global Presence:	Worldwide
Employees:	8030 (2006)
Mission:	To be a world leading source of innovative, technology-based systems for diverse defense and civilian applications.
Products:	Elbit Systems is a prime contractor for military aircraft and helicopter upgrade programs. We supply advanced airborne electronic systems and products to leading military aircraft manufacturers and end users.
Revenue/Profit:	$1,982 million (2007)
Profit:	$76.7 million (2007)
Website:	www.elbitsystems.com
Internship/career:	www.elbitsystems.com/careers.asp

El-Mul

Founded:	1992
Headquarters:	Yavne, Israel
Global Presence:	Active Worldwide, operations in Israel
Employees:	33
Research labs:	2 (one for detectors and one for nano electron sources)
Mission:	El-Mul's mission is to be a technological leader and strategic OEM supplier of detectors and devices for electron and ion beam tools used in semiconductor manufacturing, analytical instruments and mass spectrometry.
Activities:	Development and manufacture of particle detectors. Development of a new CNT electron source.
Products:	Top-quality particle detectors
R&D spending:	We maintain an aggressive R&D program, supported by a skilled, experienced staff and state-of-the-art production facilities.
Website:	www.el-mul.com
Internship/career:	oren.zarchin@el-mul.com

Given Imaging Ltd.

Founded:	1998
Headquarters:	Yokneam, Israel
Global Presence:	PillCam sales in more than 65 countries
Employees:	Around 450
Research labs:	Yes
Products:	3 PillCam imaging capsules for the Esophagus, Small Bowel and Colon
Revenue:	9 months 2008 revenues - $91.3 million
Website:	www.givenimaging.com
Internship/career:	Raanan Bookelman; Director, Human Resources and Administration

Intel Corporation

Founded:	1968 (1974 Israel)
Headquarters:	Santa Clara, California, USA,
Global Presence:	Worldwide
Employees:	86,300 (6600 Israel)
Mission:	Our goal is to be the preeminent provider of semiconductor chips and platforms for the worldwide digital economy.
Products:	Microprocessors, Flash memory, Motherboard Chipsets, Network Interface Card, Bluetooth Chipsets
Revenue:	$38.3 billion (2007)
Profit:	$7.0 billion (2007)
Website:	www.intel.com
Internship/career:	www.intel.com/jobs

IPP Delek Ashkelon Ltd.

Founded:	2007
Headquarters:	Ashkelon, Israel
Employees:	1-5
Activities:	The IPP Delek Ashkelon power plant will provide electricity to the Ashkelon desalination plant and other private consumers through the national grid.
Products:	Electricity
Total capacity:	80 MW
Website:	www.delek-group.com/Content.aspx?Page=inves

Israel Desalination Enterprises Ltd.

Founded:	2005
Headquarters:	Ashkelon, Israel
Products:	Drinking and irrigation water
Production:	330,000 m^3/day (100 million m^3/y)
Project cost:	$212 million
Revenue:	$800 million
Website:	www.delek-group.com/Content.aspx?Page=inves&Child=40

Israel Electric Corporation (IEC) Ltd.

Founded:	1923
Headquarters:	Haifa, Israel
Employees:	12,212 (9,841 permanent, 2,371 temporary) on 31 December 2007
Activities:	To produce, supply, distribute and sell electricity.
Revenue:	$5 billion (2007)
Profit:	$29 million (2007)
Website:	www.iec.co.il
Internship/career:	info@iec.co.il

Israel Aerospace Industries (IAI) MBT Space Division

Founded:	1953
Headquarters:	Ben-Gurion International Airport, Israel
Global Presence:	Worldwide
Employees:	Over 16,500 (IAI)
Activities:	The Division is leading the Israeli operations in space and as such acts as prime contractor for all military and civilian space programs in Israel.
Products:	The Space Division specializes in light Remote Sensing Satellites for Low Earth Orbits (LEO) and small and medium Communication Satellites for Geostationary Orbits (GEO). The Division also offers Ground Stations for its satellites.
Website:	www.iai.co.il

Mantis Vision

Headquarters:	Tel Aviv
Global Presence:	One office in Herndon, Virginia
Employees:	< 50
Mission:	To create futuristic interactive 3D environments that allow users to preempt situations and accelerate processes.
Products:	MVC 3D Video Camera, MVP Automated 3D Authoring
Website:	www.mantis-vision.com
Internship/career:	info@mantis-vision.com

Orbotech Ltd.

Founded:	1981
Headquarters:	Yavne, Israel
Global Presence:	> 30 offices – Asia Pacific, Japan, Europe, North America
Employees:	More than 1600 employees worldwide
Research labs:	Mainly Israel but also Denmark, Italy, Japan, Korea and the USA
Mission:	To be the leader in all the markets we operate.
Activities:	Development, manufacturing, marketing and service of capital equipment: AOI, CAM, Imaging and Repair solutions for PCB production; AOI, Test & Repair solutions for Flat Panel Display industry, Cardiac Cameras for Nuclear Medical Imaging industry
Products:	Discovery, Paragon, PerFix, Sprint, LP, InVision, SuperVision, ArraySaver, ArrayChecker - series
Revenue/Profit:	$360.6 million in 2007
R&D spending:	Around $60 million per year
Website:	www.orbotech.com
Internship/career:	CV Center – cvc@orbotech.com

Saifun Semiconductors Ltd

Founded:	1987, acquired by Spansion: 2007
Headquarters:	#6 Arie Regev St. Sapir Industrial Park, Netanya. 42504
Global Presence:	Spansion presence worldwide
Employees:	180
Research labs:	Netanya, Israel
Mission:	Saifun's mission is to be the leading IP provider to the Non-Volatile memory market.
Activities:	Development of MirrorBit technology – a charge-trapping technology for the Flash memory market
Website:	www.saifun.com
Internship/career:	www.spansionjobs.com/location_israel.html

Scopus Video Networks Ltd.

Founded:	1995
Headquarters:	Rosh Haayin , Israel
Global Presence:	Asia, Europe, US
Employees:	280
Research labs:	yes
Mission:	Scopus is committed to actively shaping the future of video delivery on next generation networks.
Activities:	Scopus Video Networks (NASDAQ: SCOP) develops, markets and supports digital video networking solutions that enable network operators to offer advanced video services to their subscribers.
Products:	IRD, IVG, Encoders
Revenue:	Revenue for the full year of 2007 was $57.5 million
Website:	www.scopus.net
Internship/career:	jobs@scopus.net

Xsight Systems Ltd.

Founded:	2005
Headquarters:	Israel
Global Presence:	Headquarters and R&D – Israel, Business Development, Sales and Projects – USA. Sales Reps in Europe and APAC.
Employees:	30
Research labs:	Israel
Mission:	Xsight's mission is to provide the aerospace community with advanced solutions for runway situational awareness and control, monitoring and management of FODs (foreign object debris) at airports.
Activities:	FOD Detection, Runway monitoring
Products:	FODetect, Intersections, FOD Ascription
Website:	www.xsightsys.com

Ben-Gurion University of the Negev

Founded:	1970
Location:	Beer Sheva (main campus), Sede Boqer and Eilat
Faculties:	5
Students:	17897 undergraduates 11786 graduates 5061 PhD
Motto:	To develop the Negev (Desert part of Israel) that consists of 60% of Israel land and has only 9% of habitants
Website:	www.bgu.ac.il

Technion Israel Institute of Technology

Founded:	1901 – idea of establishing an engineering school. 1912 – the first cornerstone was laid 1924 – the Technion opened with 17 students
Location:	Mt. Carmel, Haifa
Departments:	18 faculties - 9 engineering, 4 basic science, 1 humanities and arts, 1 Education in Technology and Science, 1 Faculty of Medicine, 1 Architecture and Town Planning and 1 Computer Science.
Students:	9,500 undergraduates 2,500 graduates 883 PhD
Website:	www.technion.ac.il

Tel Aviv University

Founded:	1956, when three small education units - The Tel Aviv School of Law and Economics, an Institute of Natural Sciences, and an Institute of Jewish Studies - joined together to form the University of Tel Aviv.
Location:	Ramat Aviv, Tel Aviv
Departments:	9 faculties, 106 departments, and 90 research institutes.
Students:	29,000.
Website:	www.tau.ac.il

Weizmann Institute of Science

Founded:	1934
Location:	Rehovot, Israel
Departments:	5 faculties – Physics, Chemistry, Biology, Mathematics and Computer Science, Biochemistry.
Students:	0 undergraduates ~1200 Graduates ~600 PhD
Website:	www.weizmann.ac.il

Part 5
Impressions

Church of the Nativity, Bethlehem

Evaluation

At the moment of writing we are already back in Holland for two weeks, so we had some time to evaluate all impressions. Organizing a study tour is done for several reasons. The most important is to catch a glimpse of the culture within companies and institutes especially in the field of Electrical Engineering but also on other fields. This will prepare the participants of a study tour to work with people from other countries. There you will find the same differences and commonalities as found during a study tour. In short, it is a crash course on internationalization.

Many companies and institutes expand their focus to international markets, something that is also seen within our own university. More and more cultural differences can be found within our faculty and an increasing number of students perform an internship or master's thesis in a foreign country. Cooperation with companies in different countries is necessary to ensure a prosperous future.

A study tour offers great opportunities for personal development. This has been and will be one of the main objectives of such a journey. Obviously it is also very important to have a lot of fun while discovering different cultures.

The *Is real study tour* had another unique objective. As the organizing committee we have tried to give something extra to our participants. This resulted in a lecture about Palestine and a visit to the West Bank and an presentation of the Peres Center for Peace. Several students told us that although the companies were very interesting, the tour to the West Bank was the most impressive. With these activities we tried to form a balanced view of the Palestinian-Israeli conflict.

Comparing Dutch and Israeli scientific institutes

One of the most notable differences of Israeli universities with universities in the Netherlands is the names of the buildings. Every building is not called after what is being done there, but called by the names of the contributor. For example we regularly had to search for building with names like the Iby and Aladar Fleischman Faculty of Engineering. In the Netherlands it still seems a taboo to have your research sponsored, so monetary contributors are rarely mentioned in public.

Every student, man and woman, served in the military for at least three years. The average age is therefore approximately four years higher than we are used to - often another year is spend travelling around the world to forget about the army. It is also common that students are married and have children, but still live on the campus.

The age of the students together with the army experience leads to the situation that every student is very devoted to their study. Besides, studying is very much promoted by the Israeli (and American) government by extensively making use of slogans like "high-tech industry now accounts for more than 54% of Israel's industrial exports, and over 26% of the country's exports".

The view of the government on high-tech industry gives many privileges to Israeli scientists and engineers. They are seen as the cornerstone of the society, especially the professors are much more respected in Israel than in our country. They are proud to be Electrical Engineer, something we sometimes seem to have forgotten a long time ago…

Comparing Dutch and Israeli companies

The culture within companies is also rather different in Israel compared to the Netherlands. Every student has the dream to build his or her own company. This leads to the fact that Israel has the highest number of high-tech startups in absolute terms after the US. Eighty percent of the 3000 companies involved in research and development are less than ten years old. If you should ask during a random lecture of some course in Electrical Engineering who has the ambition to become an entrepreneur eighty percent of them would raise their hand. If you would do the same experiment in the Netherlands it will be less than ten percent… On the other hand, Israel does not have many very big companies like Shell, Unilever, Philips and ASML, so in this way we are sort of complementary to each other.

It seems that Israeli people have a natural gift to develop new products. Existing and state of the art technology are applied to new applications continuously. It had been very inspiring to meet the people driving the economy of Israel. Their dedication to their inventions together with their huge perseverance changed the way of thinking of our participants. I would not be surprised at all if after a while several participants eventually got the ambition to start a company.

Cultural differences

On first sight there are not many cultural differences between Israeli and Dutch people. They have the same attitude and are well educated. Something you might discover, although not always applicable, Israeli people are quite direct when they ask you to do something. This also becomes very clear in the traffic: the intention to go to the right is the same as going to the right... After two weeks there was also no difference anymore between Israeli drivers and our drivers…

The number of heavily armed military and police on the streets is something you will notice the first days. Although the big cities Tel Aviv and Haifa have not had terrorist attacks for several years now, you can still feel the distrust among the people on the street. It was also rather confronting that before entering a shopping mall or restaurant you will be checked by security. Fortunately, and this is also true for Israeli people, you get used to all of this very fast.

Conclusion

After two weeks back in the Netherlands I can say that we have seen quite a lot of companies and got a good view of the industry and the culture in Israel. In Israel you will find a country full of contradictions and paradoxes. All of this has contributed to broadening our perspective on Israel, Palestine and their great technology, which was precisely the goal we set out to achieve.

On behalf of the Study Tour Committee,
Tamar Kranenburg - President

Professors

Prof.dr.ir. L.P. (Leo) Ligthart

When the ETV organizing committee approached me for the *Israel study tour*, I responded enthusiastic. IRCTR has cooperation with Israeli institutes since the nineties. I advised them to visit Israeli telecom and radar related institutes, based on my positive experience with top-level Israeli research groups and industry.

To my opinion Israel is an exciting country from economic, scientific, cultural and historic points of view. I supported the Israel excursion, because student visits to Israel are not frequently organized and European students are not familiar with the Israeli scientific and technological R&D on telecom and radar.

During the whole week, which was well organized, the atmosphere in the group was pleasant. Especially, the transportation through Israel got my admiration. The students rented vans and they drove the roads in Israel like Israeli. Another good point was that we nearly always arrived at the location in time, where a representative of the visiting organization welcomed the group.

The students had a tight excursion programme; nevertheless, they also put substantial efforts in deepening their knowledge about the old and recent fascinating history of Israel. Besides visits to universities, R&D centres and industry they made excursions to historic places at various locations in Israel and the West-bank.
It was positive that the group of students became acquainted with the Peres Peace Centre to learn about how young people try to normalize human relationships between Israeli and Palestinians.

Some of my experiences:

- Most Israeli students start their study after a 3-years military service duty
- Israeli students can participate in social programs with tasks like: taking care of children, training dogs for the blinds and many more
- Most Israeli students finish their study at BSc. level
- The students were hearty welcomed, although some companies are not used to host big groups.
- Walky-talky and mobile phones turned out to be indispensable tools.

I conclude with a big compliment for the good organization and the disciplined behavior of the student group. I regretted that I had to leave the group after one week in Tel Aviv, since I have enjoyed the company of 24 ETV students in Tel Aviv very much.

Prof.dr.ir. J. (Hans) Hellendoorn

I will remember this study tour as one that was perfectly organized. All the visits were well arranged, everywhere we arrived in time (although there was only one small navigation system), all the students cooperated well and the companies and universities that we visited were of a very high level. Some of the companies were also socially very relevant, which made them particularly interesting.

In the beginning it was not that successful. It was hard to find the right companies and get everyone involved. I remember well the day that I invited Mr. Thomas Cohn and Mr. Kobi Kurtz at ETV, two men with a large network in Israel and with enthusiasm to promote their country to young students.

Soon, there was a vivid discussion about the program, when you are in Ashkelon you can visit also this company and that institution, why not visit that company in Beer Sheva if you are so close, in Yavne we can combine … I believe we could have gone to Israel for ten weeks visiting two or three companies every day.

We had a full program with many visits. What always amazes me – this was my third study tour with ETV – is that the students actually have two programs, a double study tour. After a long day with a lot of presentations and driving they start their second study tour exploring all the local pubs until deep in the night. The next morning they are on time and start the regular tour again. Doing two tours while sleeping in multi-bed-rooms in cheap hostels is a great achievement, and should not last longer than two weeks. Now it is time to start studying again, success and lehitra'ot!

Advisors

Thomas Cohn

Let's start with my compliments for the organizing committee! The Study Tour was a well prepared one. An example is the preliminary report, that the students themselves made, in which all the information about the tour was mentioned. Also, during the tour the group was very disciplined. The students were always on time on the excursions. In Israel, people tend to plan less, since they are more problem solvers. This probably relates to the security situation, where you learn to make quick decisions and improvise solutions.

Beside that, the group showed a lot of enthusiasm. Even after a long day of excursions, the students were asking questions and seemed very interested in the next coming evening excursion. Something remarkable about the group was the ratio male female, since the group consisted of only men. In Israel the interest of women in engineering is much higher. For instance, the percentage of women at the engineering faculty of the Ben Gurion University is as high as 35%.

During the excursion at Mantis Vision, a question was asked about entrepreneurship. The CEO of this successful start-up company asked how many students were interested in creating their own company. Only one of the 24 students was considering starting a business. In Israel the numbers would probably be reversed. More and more production industry is leaving Europe. The Netherlands should distinguish itself with innovation. For this innovation entrepreneurship is needed.

Hopefully everyone enjoyed his stay in Israel. Israel is a lot in the media but now the participants had a chance to see the reality for themselves. Hopefully the participants will think back of Israel with warm feelings and will they think positively of Israel in their later business careers. It was for me a pleasure and a motivation to support this nice group of enthusiastic students. I wish each of you a successful, happy and healthy life!

Kobi Kurtz

As one of the advisors of the Study Tour, I introduced the organizing committee to some of the companies that were visited in Israel. In that capacity, I was able to bring the committee in contact with people from Technion, Mabat and Orbotech. Furthermore, I had the opportunity to join the group to some of their excursions. I accompanied them on the first day of excursions, to the desalination plant and Mabat. I was also present at the lecture from the Peres Peace Center at the Tel Aviv University.

Although the Dutch and Israeli companies do not differ that much from each other, maybe besides the number of start-ups that is much higher in Israel, this does not apply to the universities. Here can be noticed that the social side of the universities in Israel are somewhat different from the Dutch ones. Of course this has all to do with the fact that most Israeli people start their studies after they served in the military. Therefore there exist an age difference between the Dutch and Israeli students, that explains the difference in social climate at the universities from both countries.

During the time that I joined the study tour, I was quite impressed by the seriousness of the students. From some of the companies I also received nice feedback about this fact. So was the host of Argo Medical very impressed by the seriousness of the group, and by the good questions that were asked. Furthermore, I have to mention the good organization of the tour. Although it is not easy to accomplish that every one is on the right place at the right time, the committee executed the organization of the study tour very well.

To conclude, I was delighted to contribute to this study tour and I am very curious to read the impressions of the participants.

Participants

Rick van Akkeren

Shalom! More than a year ago, we started to organize the new study tour. After a while, we decided to go to Israel and that turned out to be a good choice. Once again, we succeeded in choosing a suitable destination for an ETV-study tour and that is definitely something to be proud of.

So at November 8th, we were ready for departure and the Is real study tour really started. As a committee, there were a few little things we had to take care off. Sometimes, we had to improvise and we had to organize some things at the last moment. But the reactions of the participants more than made up for this. During the tour, we received lots of compliments for the well organized activities, as well from the participants, as from the companies, as from the accompanying professors. Upon arrival on Schiphol, everyone agreed: this was an unforgettable experience!

Matthijs Alderliesten

During the study tour in Israel we visited several companies, universities and institutes. For example, we visited an interesting company, where very small cameras to swallow were produced, with lots of electronics all around. Also the power production companies were impressive with all the solar cells and dishes to generate a huge amount of energy.

The cultural trips to historical places like Jerusalem, Bethlehem and Nazareth and a lecture in the Peres Peace Center in Tel Aviv were interesting. Also our visit to Bethlehem (near the Westbank wall) was very impressive. To see how different people live together in the Promised Land is an interesting sight.

In short, during the study tour we learned a lot about our field of study and also with these experiences we can complete our study and choose our Master specialisation and elective courses. All the other experiences we carry on in our lives for many years!

Silvian Bensdorp

There are few countries in the world, whose conflicts keep on dominating the news for decades more than Israel. Therefore, beforehand, it was expected to be self-evident that a visit to the Holy Land would be interesting. After seeing many aspects of the Israeli society and its industry I can say that many expectations were greatly exceeded. There are so many aspects to this country, that it is hard to describe what it is like. On the surface it looks like just another western country. During my time in Israel I found out that it is a country with many faces. I can recommend everybody to make a visit to the holy land, since it would take more than a book to describe everything.

For myself, I had a wonderful time in Israel. Not only did the weather and the tourist attractions make it a good time, but also the travel companions and the essence of the Jewish culture interwoven into the Israeli society. It is a visit I would recommend anyone.

Geert Berghuis

Israel left me with so many impressions that I needed the photo's to remember what we did those two very intense weeks. It is amazing to see how such a small country can be so technologically advanced, considering the recent history. We have been shown where some commonly used technology is created and what technology we will be using in the future.

The committee also did a great job with the cultural program of the tour. I especially enjoyed the dialogue we had with a lot of Israelis and Palestinians and our trip to Bethlehem left a huge impression. I think the tour would not have been complete without it.

The scenery and weather were also perfect, driving through most of the country we have seen a lot. We adopted the Israeli driving style which is a lot of fun, but we were glad we returned the van in one piece.

Rico van Dongen

Getting used to the cold and rainy climate of Holland takes a lot longer than adapting to the pleasant Israeli sunshine early in the morning. However, staying in because of the rain gives you time to think about all the experiences that we had during the tour. For example, the day we went to the 'Westbank'. It is impossible to explain the tension you feel, while you're crossing a checkpoint unless you had some time to think about it yourself.

Although exploring the landscape takes a lot more time than we had during the trip, we did see a glimp of it. One thing that I will always remember is the Dead Sea. Standing upright, without touching the bottom. It is almost as if you are walking on water instead of swimming in it. I guess this is something that anyone should do once in a lifetime. Only once, because the salt really hurts if it splashes in your eyes.

There is only one way to summarize it all: Israel is definitely worth going back to some day.

Corné van Eeden

When I say Israel today, it reminds me of lots of subjects in a very successful study trip. To name a few, I remember Israel as a country of universities on which virtually every room, laboratory and building carries the name of their donors, country of cheap taxi's, country of steep roads, country of police driving with their flashing lights on all day and night, country where the restaurants serve the same salads everywhere, country with great falafel for this vegetarian, country of St. Peter's fish, country of hummus, country of war and conflicts, country with eastern and western habits, country of history, country of cultures, country of hope, country of dourness, country of beautiful Bahai gardens, country of Jews, country of Muslims, country of Christians, country of Arabs, country of Palestinians, country of Israeli, country of taking your passport with you all day long, country of nightlife, country of Goldstar and Taybeh, country of aridity, country of expiring kibbutzim, country of high tech, country of armed forces, country of a great study tour.

Frank Gorte

During the Re{is} study tour I had two great weeks. We got to see what new technology is developed in Israel, how it is developed and the way the technology is brought to the market. Also we saw a great mix of big, international companies and high tech start-ups. I was especially impressed by the great entrepreneurial spirit of the Israeli.

Apart from the technology, we also got to see a lot of the Israeli society. The culture is very open and friendly and people seemed eager to talk about almost everything. Although it is impossible to fully understand the situation, I was especially pleased with the way we had time to think about the Conflict and discuss with Israeli, Palestinians and each other.

The combination of high-tech excursions and cultural trips, combined with the Israeli nightlife, made the *Is real study tour* something I will never forget.

Stephan Groot

Before the start of the *Is real study tour* my expectations were high. All the ingredients for the making of a great experience were available: an interesting destination, a challenging programme and an enthousiastic group.

The country of Israel is one with many faces. The difference between things like street sceneries, the west and east side of Israel, the big companies and the start-ups struck me as quite characteristic for Israel. For me, the difference between the big companies and the start-ups was quite unexpected, but one could experience that often the visits to the start-ups were more challenging than the tours along the reputable companies.

Of course the greatness of the study tour was not only determined by the many study related excursions. Also the cultural highlights of Israel, like Jerusalem, the Dead Sea and a traditional Kibbutz, were worth the while. Furthermore, let's not forget the cultural excursions in the night, that contributed to the interaction with the Israeli people.

To conclude this impression: the study tour was unrealistically fantastic!

Tim Hurkmans

Two weeks filled with many visits to technological and innovative companies have showed me that Israel is much more advanced than Holland. Companies like Mantis Vision with their unique 3D capturing system, and institutes like the Technion and the Weizmann Institute, with their progressive techniques, and visiting these with the great group of students, have left me a positive imprint of the trip in my mind. The cultural trips have shown me many things that were on my list of 'Things to see in a life'. The old city of Jerusalem, the high salinity of the Dead Sea, the Sea of Galilee, where Jesus has been told to live near and wander on.

But the most impressive visit for me was the visit to Bethlehem. Located in Palestinian area, the city, surrounded by a high wall, shows very clearly the conflict between the Israeli and Palestinian people. On one side you can hear the muslims go to their prayer, while on the other side the churchbells are sounding. And you are standing in the middle, next to the high wall. That leaves an impression.

Maarten Kastelein

Two weeks seems like a long time, but it goes by really fast when you are in a country like Israel. The study tour committee succeeded in giving us a diverse, interesting and also pretty intensive program. It turned out the younger companies actually managed to show us the more interesting inventions. The most impressive to me was the handheld camera that is able to capture and create a 3D-model of any environment. It was also interesting to see how people managed to live in the desert while making optimal use of the sun and the very little rain they get.

Visiting Jerusalem and all the other cultural trips showed us the vast history of the country. But it also made us aware of the constant struggles that the land is involved in. We have seen the conflict from both sides and discussed it with both Israelis and Palestinians, which is an unforgettable experience.

Bas van Kester

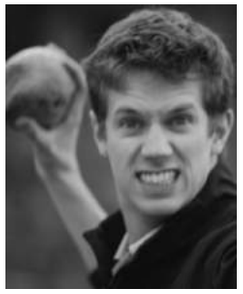
Many months ago the registration for the study tour opened. Immediatly I was interested. Normally Israel is not a very common place to go. I did not know much about Israel, but the first things that came to mind were the conflict and its high-tech industry. In that respect, my expectations were fullfilled.

During the excursions we visited a lot of companies and institutes. A common denominator during those visits was the high-tech industry and its practical applications.

Of course the conflict did not remain unnoticed. In Tel Aviv the guide pointed out some spots where terrorist attacks took place. This made a big impression on me.

But Israel is more than just these two things. During the tour we met a lot of nice and open people.

Ate Kleijn



To serve the speedy reader, a brief summary of the Is real study tour would be: two well organized weeks with a high information and cultural sensation density, in which Israel showed its many faces briefly, but clearly. The visited companies were often interesting, especially the smaller high-tech companies, which were to me the most inspiring. Before the trip I did not see myself in an entrepreneurial position. This has not changed much though, but seeing and listening to engineers who developed an idea into a successful business is just motivating.

As far as I am concerned, the cultural trips during Sabbath were the most fun and beautiful: from carefree floating on the Dead Sea to gazing at a nine meter high concrete wall from within the West Bank, looking out over Temple Mount from the Mount of Olives in Jerusalem and swimming in turquoise colored natural water in a Kibbutz: all exceptional and impressive.

Tamar Kranenburg

The week before the *Is real study tour* finally became reality had been quite busy. As organizing committee we had to take care of several final details. On Saturday the eighth of November I arrived on the train station in Delft at three o'clock in the morning. Despite of the tiredness, the pressure and the busy week I was above all excited that the study tour to the promised land was about to begin.

During the subsequent two weeks I have seen and learned a lot. We have visited advanced research centres, discovered incredible technology and met enthusiastic people eagerly trying to put innovative products on the market. It has been amazing to experience the duality of the advancements in technology on one hand and everything we hear on the news so often on the other hand. I can say without any doubt that I have never learned, enjoyed and experienced more in my life than during these two weeks in Israel.

René van der Meij

The study tour was a big success. Both the business and the cultural trips were very successful. The thing that made the biggest impression on me was the visit to the West Bank. To see the wall with my own eyes made me realize that the things on the news are for real. For me as a Dutch guy I cannot imagine how it is to live in such circumstances even now since I have visited the West Bank.

But of course Israel has much more to offer then the conflict. Before my visit I did not realise that the country is so good at technology. The most impressive things were the visits to the companies. What surprised me that the most technological inventions were made by small companies, things like the 3D modelling system at Mantis Vision, the camera pill at Given Imaging and the FOD detection system at Xsight. Of course we had a great time spending time together with the group at the evenings.

Steven Mulder

Looking back at the *Is real study tour* there are two things that stand out. First is the remarkable diversity that characterises this tiny piece of earth. Diversity in the people that live there, diversity in the landscape, and diversity in the atmosphere of the different cities. The other thing that made a strong impression on me was the culture of ingenuity. Sometimes it really seemed like the entire country is focused on getting new ideas and new solutions. When you combine this with the Israelis' incredible entrepreneurial drive, it is no wonder this small country has so many startup companies.

As a member of the organizating committee, it was also very gratifying to see all our hard work paying off. When we started this task a year and a half ago, I did not dare imagine that this huge undertaking would go so smoothly. I remember sitting at the final dinner table, quietly looking around at the participants and realising that we all had have a great time together. I am proud to have been a part of this great small study tour.

Kenneth Odijk

As the secretary of the *Is real study tour*, I can gladly conclude that the Re{is} (tour) has been a huge success. During the preparation of the tour we already saw that Israel has a lot to offer for us electrical engineers. While back in the Netherlands the Re{is} brings up a lot of nice memories, which reinforces our previous thoughts. Like enjoying the view of Jerusalem, swimming in the Dead Sea and taking a refreshing dive in the Mediterranean see during sun set.

Also the variety of companies visited made the tour interesting. Elbit is one of the companies which I really enjoyed getting to know. The presentations were like watching a documentary.

As a driver I experienced the great differences in the environment. The steep hills in Jerusalem, the desert in the centre of Israel and the beaches along the coast. I did not even mention the times we went to City hall and Eli's pub. These were just a few of the memorable things which crossed my mind. As a final remark I would like to thank all the participants for making the *Is real study tour* a success.

Daniël Petrarca

When the *Is real study tour* started on November the 8th, I had no idea whatsoever to expect from Israel. That Israel is more than a warm country located near the sea was made clear in the following sixteen days. My impression of Israel is that it is a country with an impressive history. It is not just a 'young' country, even though it only exists for only sixty years: the history runs far deeper.

I was surprised by the presented innovation with the companies and institutes, that we visited. The large number of high-tech startups and the popularity of the technical studies contribute to the greatness of the country. And further were all the excursions, besides one, very educating, especially that with the start-ups. In my opinion the excursion to Mantis Vision was the most educating one.

Concluding I am very satisfied that it was possible for me to have this experience.

Hugo Poley

Sitting back and reflecting on the *Is real study tour* I have to say those weeks went by quickly. After arriving in Tel Aviv we spent the first few days heading south towards Ashkelon and the Negev desert, which is a quite specific landscape. Also it was nice to see how people try to make a liveable place from this desert.

On Thursday evening of the first week we had a lecture from the Peres Center for Peace and the next day we spend a day in the West Bank, it was interesting to see views from both sides and in my opinion peace is far away.

The Dead Sea was also quite an experience, although not pleasant for your eyes. And on the end the tour there was a trip to the Galilee area and this was a big contrast to the south.

Further what was noticeable is that Israel really focuses on technology which was also reflected in all the companies, universities and institutes we visited.

Johan Splinter

Before our trip to Israel I heard about Israel in stories from my parents, my grandmother, the old testament, but most of all, the news. I could never stop wondering why anyone would want to live in a country that actually has been in war since before it even existed.

Looking back to our stay in Israel, especially our stay in Tel Aviv, I feel like I know part of the answer. We have seen technical highlights, beautiful landscapes, historical places and building and, most of the trip, had fantastic weather. Although guards with metal detectors were posted in front of every post office, I was especially impressed by how much the conflict did not influence everyday life in Haifa, which has an mixed population with Arabs and Jews.

Israel is a country which makes a lot of progression in a broad sense, and living in a difficult area is an issue most of the immigrants are very willing to accept and work on in return.

Erwin Stout

Before the Saturday November 8th, I did not have a very good idea what to expect from Israel. Would it be western country, or maybe more Arabic, will the war be very noticeable in daily life, how innovative are the companies. These were just some examples of the questions I asked myself. But now, back in the Netherlands, to me it is as clear as daylight that Israel really is a wonderful country!

During our stay we visited a lot of interesting companies. It was very nice that, when I watched the Dutch news on television the week after the study tour, an Israeli robot was presented as very revolutionary and innovative, and I had seen this robot in real life a week before. Besides that, we also visited a lot of fascinating cultural spots. Particularly the Dead Sea and Jerusalem were nice to visit and of course, I also want to mention our trip to the West Bank.

In conclusion I can say that when I have the chance to go back to Israel once again, I would immediately take it!

Pim Tamerus

Before the *Is real study tour* I did not know what to expect in Israel. You think in the first instance of the ongoing conflict in which the country is situated. Now that we are back, I can conclude that the conflict is an important factor. The students there are older because of three years of service and also in many companies and institutes you see that the army is a major motive. Its said that war entails a big technical progress and in my perspective that can be seen in a lot of advanced products and research. Apart from this, Israel is a beautiful country. In addition to the planned cultural excursions have the on free days arranged trips to the West Bank and a Kibbutz certainly been worth while.

All in all, I have seen and learned a lot on this tour. I will definitely go back again to see more of the country.

Tim Velzeboer

I am looking back at two very great, fun and interesting weeks. Since the land of Israel has a special place in my life it was again a delight to be there. Before the trip I already knew Israel was a very developed country in high-tech research and high-tech projects. Now in these two weeks, we all had the chance to actually see it and experience it with our own eyes. It was an unique chance and a great privilege to be able to join this well-organized study tour and see all this very impressive companies and people.

The young start-up companies really impressed me. Besides the high-tech explorations there were other things that made a big impression on me. The presentation at Tel-Aviv university from the Peres Foundation. How young people start work on peace in fun and educative ways, bringing young people together. To me this is such a great, high and noble act.

At Ben Gurion University I was touched how students were involved in social activities and make their city a better place. We Dutch people can definitely learn from the young Israeli.

Tom Verboon

Israel was extremely impressive to visit. Apart from my own preparations of what the culture should be, on duty for the preliminary report, it was still unsure how we would experience the ancient and diverse cities in real life. From the beginning the high-tech climate did not seem to fit the profile of the country. And it actually did not.

However, the state of Israel promptly proved entrepreneurship and the tense situation embedded in their very own culture, can live together. It somehow makes the country even more interesting. In my memory the visits to the high-tech startups will stay; the local entrepreneurs presented a very comprehensive story in business administration combined with electrical engineering. Besides, some cultural sights I will not forget. The most tangible was no doubt the Western Wall. On the second place is the Dead Sea, it was incredible how something very predictable could still surprise. In a nutshell, it was amazing!

Michel Verhulst

Once upon a time at Schiphol, among 23 other students Electrical Engineering I was waiting for our flight to the far Israel. As I have been in the Middle East a couple of times I was very curious how this special country would be. I was not disappointed as Israel turned out to be a very interesting country indeed.

What surprised me most was the large technical knowledge in this country. Israel is mostly known for the conflict, but there is so much more. Of course a lot of research is coupled to the military, but they also manage to find ways to use these techniques for more peaceful activities.

The historic sites and the nature also were very impressive, with lots of very different things really close to each other. But the building that impressed me most was not one of the beautiful buildings in Jerusalem, it was the wall around Bethlehem. This wall combined with the stories from both sides really made me see how complicated this issue is.

Far to soon we were back in Amsterdam. Tired, but with memories for a lifetime.

Statistics

On the final day, the ever capable diary committee handed out a poll. 24 ballots were handed out and 20 were returned. The poll consisted of 57 questions, divided in two parts. The first part was about the participants and their behavior during the trip. The second part was about the trip itself: the companies, cities and events. Both the answers and the interpretation of it can be viewed as highly subjective. However, the following gives an interesting overview of the trip.

The overall level of the excursions can be considered high. Six companies and one cultural excursion were voted best excursion. However, one excursion received the most votes by far: Mantis Vision was considered to be the best excursion by 45% (9 votes) of the participants. Given Imaging, Saifun Semiconductors, Xsight Systems and the cultural excursion to Jeruzalem received two votes.

It is not so clear on which excursion the participants thought they learnt the most: with four votes both Mantis Vision and Saifun Semiconductors won this title, however there were votes for ten different excursions, including the cultural excursion to Jeruzalem and to the West Bank (both two votes).

A lot of people gave inspiring speeches. When divided in categories, people were inspired by speeches about the Conflict (9 votes), about technology-driven entrepreneurship (4 votes) and about the Study Tour itself (6 votes). With four votes the Peres Center for Peace gave the most inspiring speech, closely followed by professor Kupferschmidt who gave a speech about the history and future of Israel during the final dinner. Ate Kleijn, who thanked the committee on behalf of the participants for all their hard work also received three votes for his words. People we received two votes for their inspirational speeches were Thomas Cohn and professor Ligthart. Although Tamar had the most opportunities to inspire us, he did not get any votes at all.

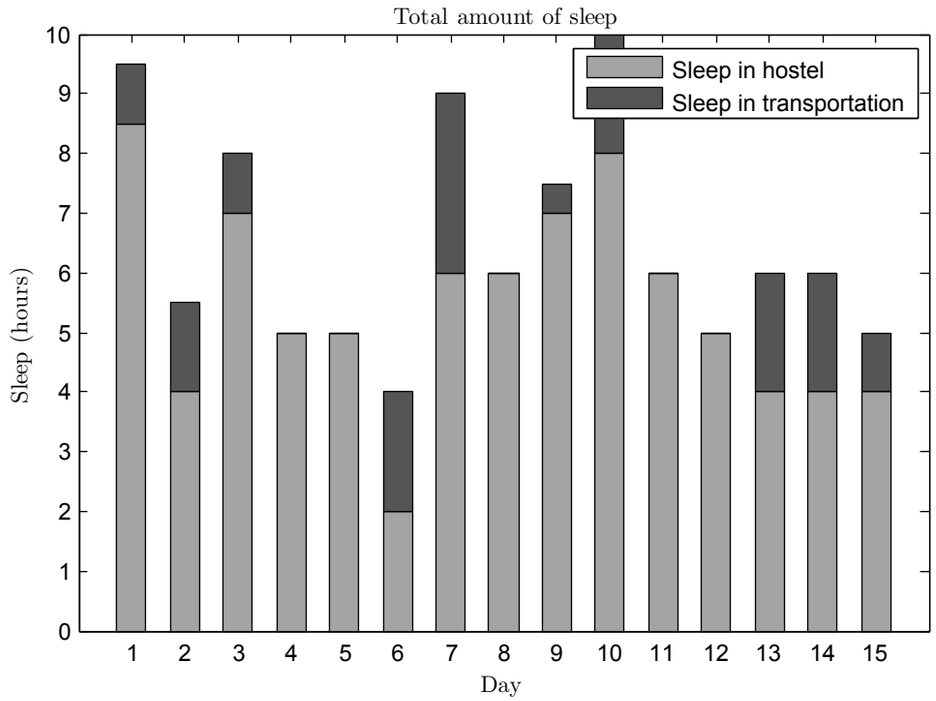
A more clear answer can be found when evaluating the most impressive event: 14 people voted for the excursion to the West Bank, or parts of it, like the quote ‘Ich bin ein Berliner’ on the Wall. Apparently one person thought a decapitated cat was more impressive, another thought the ‘stressfles’ was impressive.

The excursion to Saifun was the most in depth, which may be why they did not win in the category above. Perhaps the level was too high for some participants. The great presentation did convince a majority of the participants that Saifun Semiconductors had the most R&D. Intel came in second. It will never be known if this criterion was viewed relative to the company’s size, or in absolute numbers.

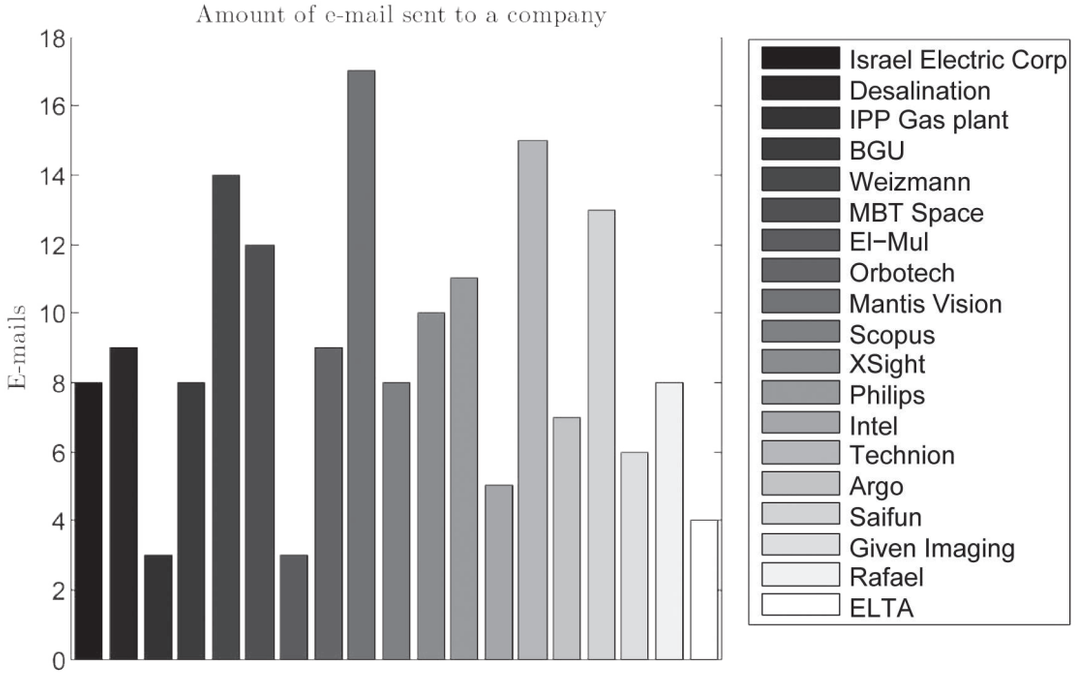
The excursion to IEC Ruthenburg received just one vote for best excursion, which is still more than the companies who did not get any votes in that category. However there was one aspect where they blew away the competition, receiving 75% of the votes: IEC Ruthenburg was considered to have the best lunch.

Although Scopus Video gave really in depth presentations about their products, there was no clear answer to the question ‘What was the coolest Scopus Video product?’. The award for the best town goes to Jeruzalem. With ten votes she just beat Tel Aviv, who received eight votes.

Interesting excursions became even more interesting when there was room for good Q&A. More than half (12 votes) of the participants thought Gorte asked the most questions, beating Berghuis’ 5 votes. Professor Ligthart deserves to be mention specially, because even though he only participated in half the Study Tour, four people thought he asked the most questions. When it comes to quality, and not quantity, the image is less clear. A small majority of five people thought Berghuis asked the best questions, followed by Gorte with four votes. Again professor Ligthart is mentioned, receiving three votes, together with Mulder. someone also mentioned on his questionnaire the longest question award should go to Gorte.



It is also shown that it is possible to work hard ánd play hard. When asked who drank the most and slept the least, all votes went to the infamous drinking team Gorte (14 and 10 votes), Akkeren (6 and 6 votes) en Berghuis (1 and 1 vote). So the people who asked the most questions during excursions, also had the most fun at night. Even after being warned extensively, Alderliesten received the most votes (six) for the '*lafste borrelaar*' (weakest drinker). Apparently someone thought the person who drank the most, was also the 'lafste borrelaar' Because the inquiry was anonymous, we will never know what weird definition of 'laf' this person uses. The related spread of '*de apatische volksstroming*' (impassiveness), concentrated in Stout. However, these results are less decisive, because ten people receive votes for weakest drinker and even twelve people received 'apathy' votes.



In total 171 e-mails were sent to organize the excursions. Also, the Committee held 47 internal meetings, organized three meetings for all participants and invited the former Study Tour Committees to have a drink twice.

Some things went smoothly during the trip, other things appeared to be more tough. For example, the voting game was only done successful about half of the times. Even when we landed at Schiphol Airport, we manage to mess it up. More than half of the participants voted Petrarca to be the person messing up the most, followed by Kleijn. Perhaps Kleijn's six votes for messing up the counting game came from the fact that 15 people thought he was late the most, whereas Petrarca received just 5 votes. Kleijn had a good way to make up for this behavior. Even though we had a lot of fun and bad word jokes, he received ten votes for making the best word joke, although it must be said that everyone proved to be good at this game.

The best driver was Velzeboer, probably because of his fine choice of music (this music was actually brought by Kenneth, Ed.) and the way he could drive and entertain his passengers at the same time. Together with his partner Odijk, they received eleven votes. Since the van could only seat nine people, this is quite an accomplishment. The second best couple was Berghuis and Stout with six votes. Probably the sweet voice of our navigator Amy scored some points for them, although she also received one vote for being the most difficult person in the morning.
Poley's years of experience in driving around parcels did not do him any good, since he only received two votes. Steven received one vote, which he probably casted himself, because he is also the only driver to hit something with the van.

The questionnare also demonstrated that democratic policing does not work. The '*stressfles*' (a bottle only to be opened in case of stress) was stolen in the hostel in Haifa. Seven people thought a participant did it, however nobody received more than one vote. Suspects are: Akkeren, Petrarca, Splinter, Tamar (who was the owner), Kastelijn en Kleijn. Two people blamed hippies, three people blamed the American neighbor and interestingly two people thought a 50 centimeter high wooden statue did it.

Various remarks

Presenter at IEC Ruthenberg Powwr Station: *"I'm not a pessimist, I'm an optimist with some experience."*

B*rgh**s (op het toilet, doelend op zijn zwembroek): "*Kut, er zit een knoopje in."*
V*rb**n: "*Echt waar...?"*

V*rb**n: "*Rick heeft twee kanten…"*
Kr*n*nb*rg: "*Rick is rond, dus die heeft geen kanten."*

G*rt*: "*Hij is A te Kleijn en B te laat."*

Kr*n*nb*rg (in Bethlehem): "*De falafel aan deze kant van de muur is veel lekkerder dan aan de andere kant."*
St**t: "*Kost wel wat moeite om het te krijgen."*

Kr*n*nb*rg: "*Ik heb stress, want de stressfles is weg."*
Kl**jn: "*Het is een soort Heisenbergfles."*

G*rt* (tegen ober tijdens gezamenlijk diner): "*Neem zelf ook wat."*
V*n *kk*r*n: *"Je collega bijvoorbeeld."*
G*rt*: "*Die staat niet op de kaart."*

V*n *kk*r*n (schijnend met de Technion laserpointer in Kleijns private area): *"O jee, een kruisraket!"*

V*lz*b**r: *"We moeten Petrarca over de rooie krijgen."*
V*n *kk*r*n: "*Moet hij over Kastelein heen dan?"*

V*n *kk*r*n: *"Het is vandaag Sabbath, dan drink ik niet".*

P*tr*rc* (over zijn vriendin, die bij vertrek en aankomst op Schiphol staat, maar waarvan je niet weet of ze tussendoor weggaat): *"Het is net een koelkastlampje."*

V*rh*lst: *"De tranen schieten me in de ogen."*
Spl*nt*r: *"Zolang het de Palestijnen maar niet zijn."*

St**t (rijdend door de Negevwoestijn): *"Ik denk niet dat ze hier kabel-tv hebben."*

Ping achter de bar in Jerusalem: *"Why would you order something that is disgusting?"*

Presenter at Elbit (over lange afstandsdetectiesysteem): *"If your enemies are very close to you, you can see them."*

V*n *kk*r*n: *"Dan gaan we naar de geboortekerk van Jezus."*
G*rt*: *"Is Jezus in de kerk geboren?"*

V*n *kk*r*n (over excursie naar de West Bank): *"Neem je paspoort mee"*
B*rgh**s: *"En zorg dat je je kont goed afveegt, daar gaan ze waarschijnlijk kijken."*

G*rt* (tegen Kr*n*nb*rg): *"Leuk, zo'n Tamar Region, maar dat haalt het niet bij een Frankrijk"*
P*l*y: *"Huh, hebben ze daar iets van Gorte dan?"*

H*ll*nd**rn (refererend aan het busje van V*lz*b**r, dat heen-en-weer schudt): *"Ze hebben daar toch geen vrouw in liggen?"*

V*n d*r M**j (nadat V*n *kk*r*n zijn hoofd stoot in het busje): *"Hey, je hebt daar ineens een heel kaal plekje!"*
V*n *kk*r*n: *"Het is geen kaal plekje, het is een aura."*

G*rt*: *"Ik heb gisteren met dat leuke barvrouwtje gepraat."*
V*n d*r M**j: *"Welke?"*
G*rt*: *"Die met heel veel haar."*
T*m*r*s: *"Dat was toch een kerel?"*

B*nsd*rp (over de scrambled eggs): *"Er zijn vandaag ook encrypted eggs!"*

*v*d G*n*r's response to P*l*y's incorrect answer to a question: "*No. That is a good answer though."*

Tijdens een rondleiding door het Weizmann Institute passeren we een man, die met een buraeustoel door de gang loopt. G**d*: *"Look, that's our chairman."*

Kl**jn (over het verkeer in Jerusalem): *"Everybody is very horny on the street."* (Zich herstellend): *"And with horny I mean they horn a lot."*

Presenter at Elbit (over eisen aan Laser Range Finder): *"If you're going to kill someone, why worry about his eyesight?"*

Recipes

Hummus

Ingredients:
1 12-oz can garbanzo beans;
1 garlic clove;
2 tsp. extra virgin olive oil;
2-3 tsp. tahini sauce (sesame paste);
juice of 1 small lemon;
½ tsp. salt;

Preparation:
- Drain 1/3 of the water from the can of garbanzo beans into a small bowl. Set aside for later use.
- In a blender, mix together the garbanzo beans with the remaining can water and the rest of the ingredients.
- Blend for 1-2 minutes until a smooth, slightly fluid paste is formed.
- If desired, add small amount of the saved can water and blend to create a more fluid consistency.

Grilled eggplant

Ingredients:
1 large eggplant;
3 tsp. olive oil;
2 tsp. balsamic vinegar;
2 garlic cloves, very finely minced;
1 pinch each thyme, basil, dill, and oregano;
salt and freshly grated black pepper;

Preparation:
- Heat grill.
- Slice eggplant about 1/2-inch thick.
- Whisk together the olive oil, balsamic vinegar, garlic, herbs, salt, and pepper in a small bowl.
- Brush both sides of the eggplant slices with the oil and vinegar mixture.
- Place eggplant on the hot preheated grill. Grill about 15 to 20 minutes, turning once.

Falafel

Ingredients:
225g chick peas;
1 onion, very finely chopped;
1 garlic clove, crushed;
1 slice of white bread, soaked in a little water;
1/4 tsp. cayenne;
1 tsp. coriander, ground;
1 tsp. cumin, ground;
2 tsp. parsley, finely chopped;
salt, to taste;
oil for frying;

Preparation:
- Soak the chick peas overnight.
- Cover with plenty of fresh water and cook for 1 - 1 1/2 hours until tender.
- Pound or blend the chick peas to a purée.
- Squeeze out the bread and add to the chick peas together with the rest of the ingredients. Knead well for a few minutes.
- Let the mixture rest for 1-2 hours, then roll between the palms into firm 1” balls. (Wet hands make this easier).
- Heat oil (at least 1 inch deep) in a pan to about 180°C, and fry the balls, a few at a time, until nicely brown all over — about 2-3 minutes.
- Drain and serve hot with lemon wedges.

Did you know...

...that Matthijs performed the rain dance after the rain had already come?
...that Daniel's lesson in touch screens costed between 300 dollars and 300 NIS?
...that the average bladder capacity of the participants is comparable to a mouse's one?
...that because of that there was no lack of female behaviour during the trip?
...that Hugo "ate something wrong" on the first collective dinner?
...that Pim knows when he had his last drink in a pub.... but doesn't know how much he can take in bed?
...that Isreali roads can be very bumpy?
...that this is no valid reason for Hugo to get sick?
...that learning Hebrew will cost you some extra km's in an Israeli cab?
...that this learning money includes a practical lesson and an emergency stop?
...that the big black statue at the end of the stairs never had so much attention?
...that Rick wasn't able to keep standing upright after a few drinks in Mike's place?
...that René didn't need a swimming shorts after the same visit to Mike's Place?
...that Tamar and Frank paid 20 NIS for a 400 m. cab ride so they wouldn't get wet?
...that they drove for 5 minutes because the driver did not want to rip them off?
...that if Ate's carreer in engineering doesn't work out, he always can start a falafel place?
...that you couldn't hear Tim H. when he's drunk?
...that, like on the Columbus Study Tour, the babe counter worked very fine?
...that a group of about six participants preferred a cold dive in the Mediterrean Sea instead of a longer sleep?
...that the first night out in Tel Aviv became about 50 euros more expensive, due to telephone costs?
...that Frank was still drunk 2 days after arrival at Schiphol?
...that Tamar's callsign was November Papa?
...that Tom gets shy when Israeli girls show interest in his Adonis-like appearance?
...that every single person of the group kept floating in the Dead Sea, despite the BMI of some?
...that Corné was the only one who managed to keep Frank out of the room?
...that Silvian - treasurer - couldn't actually use the committee's cool credit card?
...that Frank likes to talk so much he can cause the vans to get lost simply by using the walkie-talkies?
...that both Johan and Tim V. found a new usage for their suitcase belt?
...that Michel still had his regular participants booklet, even though it was ripped to pieces?
...that a small group of Delft people can impress a whole bunch of Brazilians, just by singing an Elektro-song?

...that prof. Ligthart and his wife had their first two grandchildren during the tour?
...that prof. Hellendoorn saw a submarine doing surveillance in the Haifa harbour?
...that Thomas Cohn knows approximately 50% of all people in Israel?
...that Kobi Kurtz knows the other half?
...that Corné was the only one who managed to keep Frank out of the room?
...that Geert couldn't say no to the bartender in the Post Bar?
...that Pim went on a solo-excursion to visit a friend in Jerusalem on his day off?
...that Geert had the dubious honor to be the first failure on the tour?
...that Tim H. only talked about China while we were in Israel?
...that the former Board members were really happy discovering the City Hall?
...that the City Hall in Haifa is on all aspects comparable to the one in Utrecht?
...that Tim V. almost had a nervous breakdown because of the traffic in Jerusalem?
...that, due to apathy, Erwin could not have had a nervous breakdown even if his life depended on it?
...that Rico managed to invite three goodlooking Swedish girls to have a drink?
...that Hugo had the lightest suitcase by far?
...that Rick had the heaviest one?
...that one couldn't buy a small beer in the hostels, but only big ones?
...that Tamar actually could pronounce the words 'preliminary report' correctly
...that Tamar thinks Delft is comparable to China?
...that Amy managed to find the only security leak in the tightly monitored West Bank border?
...that an Israeli girl in a shwarma restaurant asked to pass the sauce, to everybody's surprise, in Dutch?
...that just before that some heavy tinging with descriptive comments was going on, in Dutch?
...that Hugo is able to hold a cup of water - while sleeping?
...that Geert went out for a romantic walk with Amy in Tel Aviv?
...that the next morning, Amy was so upset that she couldn't find the right way?
...that you can get both Daniel and Maarten quiet just by playing MP3s at double speed?
...that Johan impressed everyone by talking about pipeline stages?
...that you can wake up Stephan in the middle of the night to perform a 'boks'?
...that Kenneth managed to stay awake during all presentations except for the final one?
...that Silvian job as treasurer got a lot harder because of the parking system in Tel Aviv?
...that Steven gets in a very bad mood when he is awakened by people drilling through the roof?
...that the Port Inn hostel managed to squeeze a single 2 kg fish into its aquarium?
...that Bas spent his final night in Haifa cuddling a bottle of liquor?
...that Johan rips his shirts apart when he is done with them?

Thanks to...

The *Is real study tour* committee whishes to express many thanks to ...

- The board, former board and the honorary members of the Electrotechnische Vereeniging;
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- All the participants for their commitment and interests during the Tour;
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- The members of the Committee of Recommendation;
- The Dean and the board of the faculty EEMCS for their support;
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- All people involved in organising the excursion at their company or university;
- The Columbus Study Tour Committee for their advice and recommendations;
- And all other people who have contributed to the tour.

Colophon

Size:	B5 (176 mm x 250 mm)
Paper:	
Cover:	250 grams/m^3
Body:	100 grams/m^3
Styles:	
#Header	ITC Eras Std, bold, 18pt
#Paragraph header	ITC Eras Std, demi, 12pt
#Body text	Oranda BT, roman, 12pt
#Page header	ITC Eras Std, book, 20pt
Software:	Adobe Illustrator CS3
	Adobe InDesign CS3
	Adobe Photoshop CS3
Hardware:	ETV computerpark
	HP Color Laserjet 2605dn
	Animo A140


UDelft

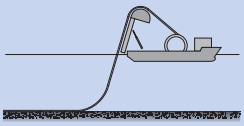

LEBANON
SYRIA
Golan
Haifa
Tiberias
Netanya
Tel Aviv
West Bank
Jerusalem
Ashkelon
Gaza
Masada
Beer Sheva
Sde Boker
JORDAN
Negev Desert
EGYPT
Eilat

Hoe leg je 100 km staal in 2 dagen op de zeebodem?

Vraag Huisman hoe je zo efficiënt mogelijk een oliepijpleiding op de bodem van de zee kunt leggen en je krijgt vrijwel zeker een verrassend antwoord. Met het schip Seven Oceans kan onze opdrachtgever Subsea 7 inmiddels pijpen leggen tot een waterdiepte van 3000 meter. Bij Huisman ontwikkelden we daarvoor een bijzonder pijplegsysteem, met als basis een stalen klos met een diameter van 28 meter en een gewicht van 900 ton. Vanaf een zogenaamde 'spoolbase' op de wal worden daar stalen pijpen van een kilometer lengte omheengerold. Op open zee worden deze pijpen weer afgerold, rechtgebogen en op de zeebodem gelegd. Het is slechts één voorbeeld van de sterke staaltjes techniek die de medewerkers van Huisman steeds opnieuw weten te realiseren. Ben jij een (ervaren) technicus en wil je op nuchtere Hollandse wijze meewerken aan technische prestaties van wereldformaat, ga dan naar **www.huisman.info**.

Efficiënte methode

De hier beschreven 'reel lay-methode' is de snelste methode om oliepijpleidingen op de zeebodem te leggen: doordat de pijpdelen op de wal al aan elkaar zijn gelast, kan het schip tijdens het leggen van de pijpleiding gewoon doorvaren. Met een legsnelheid van 35 meter per minuut kan er in twee dagen tijd 100 kilometer staal op de bodem van de zee worden gelegd.



Huisman breekt records

De klos waarop de buizen gedraaid worden, is met een diameter van 28 meter en een eigen gewicht van ruim 900 ton de grootste spoel ooit gemaakt. En ook de hoeveelheid staal die de spoel kan vervoeren, 3500 ton, is een nieuw record.

Hoe kunnen hbo/wo-technici ons daarbij helpen?

Huisman is gespecialiseerd in het ontwerpen en bouwen van hijskranen, pijpleg- en boorinstallaties voor de scheepvaart-, offshore- en civiele industrie over heel de wereld. Onze groeiende onderneming biedt mooie kansen voor ambitieuze technici op hbo- en wo-niveau. Want alleen met de kennis, creativiteit en het lef van onze medewerkers kunnen we ons bedrijfsdoel realiseren: van concept tot constructie, waarbij unieke prestaties in unieke projecten worden gerealiseerd. Wil je meer weten over Huisman, ons werk en onze actuele vacatures, ga dan naar **www.huisman.info**.

Huisman

UNIEKE PRESTATIES VRAGEN OM UNIEKE MENSEN