## Summer Internships 2012

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Google

Supporting a coding project in field of text processing

Company: Google

Position: Software engineer intern.

Job Description: Supporting a Coding project in field of text processing.

Requirements: good programming skills (C/C++), studying toward MSC in CS.

Full/Part time position: for part time job during the year (2-3 days a week).

Contact Details: Efrat Aghassy, aghassy@google.com
Check Point

Detecting computer intrusions based on facial recognition technologies

Company: Check Point Software Technologies

Job Description: Create an innovative Endpoint Security solution targeted at authenticating users of Personal Computers by facial recognition (using laptops with built-in camera). We will implement a standard algorithm of “Acquiring” facial data and integrate with Microsoft Windows to allow validation of interactive user. The validation data will be used for either access control or, less system-critical, verification and notification in case of mismatch.

Requirements: Programming experience in Microsoft Windows OS; some background in algorithms.

Full/Part time position: The project should be implemented by a team of 2-3 graduates. Phase I deliveries should be expected within 2 months, with Phase II deliveries requiring additional month to implement.

Contact Details: Leonid Belkind lbelkind@checkpoint.com

Detecting computer intrusions by using behavioral biometrics

Company: Check Point Software Technologies

Job Description: Create an innovative Endpoint Security solution targeted at identifying users by patterns of use of their personal computer, taking multiple parameters into consideration and analyzing deviations from agreed profile.

Requirements: Programming experience in Microsoft Windows OS; some background in algorithms.

Full/Part time position: The project should be implemented by a team of 2-3 graduates. Phase I deliverables should be reached within ~2 months with Phase II requiring additional month.

Contact Details: Leonid Belkind, lbelkind@checkpoint.com
Develop an iPhone application which will configure Check-Point security devices using serial connection

**Company:** Check Point Software Technologies

**Position:** iPhone applications developer

**Job Description:** Develop an iPhone application which will configure Check Point security devices using serial connection.

**Requirements:** Previous experience in iPhone applications development. Nice-to-have – knowledge in networking

**Full/Part time position:** Full or Part time

**Contact Details:** Gera Dorfman 052-4245195

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**SensorNet large data analytics project**

**Company:** Check Point Software Technologies

**Position:** SensorNet data analyst

**Job Description:** Join Check Point’s SensorNet large data analytics project to conduct statistical and machine learning research on a very large real world data set.

**Requirements:** Must have strong statistics background/completed coursework. Must be fluent in Python programming – preferably in a Hadoop based MapReduce environment, but is not required. Familiarity with Machine Learning algorithms would be a definite plus, but is not required. Familiarity with R programming would be good, but is not required.

**Full/Part time position:** Full time
Traffic patterns and construct models for applications detection

Company: Check Point Software Technologies

Job Description: Investigate traffic patterns and construct models for applications detection based on network traffic and network behavior

Requirements: Experience and knowledge in statistical models and machine learning

Full/Part time position: Part time

Contact Details: Ori Aldor oaldor@checkpoint.com
DSL (domain specific language) development for luaCLI commands and patterns

**Company:** Marvell Israel. **Location:** Petach Tikva

**Job Description:** The development includes definition analysis, design and implementation of DSL modeling for CLI commands. DSL development requires understanding of switching/routing features and protocols, modeling of CLI definition, ability to analyze requirement CLI implementation, LUA script language.

**Requirements:** C, JAVA, Data communication knowledge, script languages (python, lua, ruby, etc) – an advantage

**Full/Part time position:** Full time/ 3 months

**Contact Details:** internship-il@marvell.com

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**New algorithm implementation for routing engine LPM (longest IPv4 and IPv6 prefix match)**

**Company:** Marvell Israel. **Location:** Petach Tikva

**Job Description:** LPM algorithms development requires understanding of routing protocols, modeling of new algorithms in software. The development includes new algorithm definition analysis, design and implementation and benchmarking of different LPM algorithms.

**Requirements:** C, Algorithms, Data communication

**Full/Part time position:** Full time- 3 months

**Contact Details:** internship-il@marvell.com
Develop measurement tools for configuration management in the cellular communication infrastructure and testing team

Company: Marvell Israel. Location: Petach Tikva

Job Description: Development of measurement tools for performance evaluation of configuration management tools. The measurement tool will run on Clearcase and Clearquest DB and will check the performance of common commands. By analyzing the output we will identify performance problems and will try to solve them.

Requirements: Software development experience and knowledge

Full/Part time position: Full time/ 3 months

Contact Details: internship-il@marvell.com

Development of graphical tool for audio events in the cellular communication infrastructure and testing team

Company: Marvell Israel. Location: Petach Tikva

Job Description: From the moment the cellular phone is turned on there is logging of all the messages running between the different layers in the cellular phone. The suggested project is planned to screen (on offline) only the audio messages and present the audio events on a timeline. In the first stage we would screen the audio events into a text file and in the second stage we would the events graphically. The purpose of this tool is to improve the audio problems debugging in advanced stages of the development process or at the client.

Requirements: Experience with C/C++; Experience with Matlab- preferred

Full/Part time position: Full time/ 3 months

Contact Details: internship-il@marvell.com
Development of graphical tool for mobility and measurements events in multi RAT environment at the cellular communication infrastructure and testing team

**Company:** Marvell Israel. **Location:** Petach Tikva

**Job Description:** One of the biggest challenges a cellular modem has to face is roaming between different radios technologies such as: GSM, WCDMA and LTE. Layer T1 is the Physical layer that “converts Air to Bites”, this layer is controlled by messages from the protocol layer in order to enable complete portability between the network technologies. The suggested project is designed to provide a tool that will screen (offline) only the L1 related messages and to present them on timeline. Meaning the tool will get input of binary file in ICI, analyze it and present graphically all the events between the protocol to L1 layer.

In the first stage we could screen the messages to a text file and in the second stage to present them graphically.

**Objectives of the tool:**
1. Assist analyzing logs recorded in test house, field test IOT’s for debugging in L1 layer.
2. Learn the network behavior and the used parameters in order to develop and improve the test environment
3. Improve the handling of portability problems in advanced stages of the development process or at the clients’.

**Requirements:** Masters student who completed SW development projects in his undergrad studies with proven experience in C/C++/C# development

**Full/Part time position:** Full time – 3 months

**Contact Details:** internship-il@marvell.com

Switching architectural simulations development

**Company:** Marvell Israel. **Location:** Yokneam

**General Background:** Marvell’s Switching team is using the Opnet tool in order to simulate its future switches architecture. The Opnet tool is composed of many blocks that are written in C++ and simulate the switch unit’s behavior.
Job Description: The selected student will get the opportunity to:
- Model Switching units
- Write Opnet subroutines in C++
- Run Opnet simulations on their modules and analyze the results

Requirements:
Mandatory: Experience with C++
Preferred: Excelled in the following courses:
- Intro to software engineering
- Parallel and decentralized development

Full/Part time position: Full time position for 3 months

Contact Details: internship-il@marvell.com

Switching architecture intern

Company: Marvell Israel. Location: Yokneam

General background: Marvell’s networking unit designs packet processor ASICs, used in networking switches and routers. The switching architecture team explores new features and technologies, defining tomorrow are networking products.

Job Description: The intern will perform 1-2 research projects involving future networking technologies and innovative VLSI algorithm development. Some of the research tasks will require running simulations. The internship will focus on one or more of the following topics:
- Routing Longest Prefix Match (LPM) algorithms
- Time synchronization in packet networks
- Networking related memory compression
- Efficient high performance counter management
- Next Generation Networking (NGN)
- Long Term Evolution (LTE) cellular technology
- Vehicular networks

Required Skills: B.Sc. in Electrical Engineering, Computer Engineering or Computer Science Advantage for M.Sc. graduates.
- Research experience
- Background in networking - must
- Experience with running simulations – advantage
• Self-learning

**Full/Part time position:** Full time - 3 month position

**Contact Details:** internship-il@marvell.com
Company: Mellanox Technologies

Job Description: We are looking for sharp M.Sc. and Ph.D. students for various architecture positions and advanced development. If you are a networking enthusiast and if want to develop architecture and bleeding edge technologies in a dynamic environment, your place is with us! The architecture positions including definitions of algorithms, interfacing HW-SW systems, optimizing hardware-software performance, etc. The Advanced Development positions include developing of bleeding edge software components for protocols, and for optimizing networking stack and SW-HW interfaces.

Requirements:
- B.Sc. CS/EE Summa Cum Laude
- Good understanding of networking (protocols, OSI model, etc) - Benefit
- Good understanding of operating systems - Benefit

Full/Part time position: Full time

Contact Details: Vicky Palantic, HR, Vicky@mellanox.com 054-6259724
Dror Goldenberg, VP Architecture, gdror@mellanox.com 054-4478308

Software engineer

Company: Mellanox Israel

Position: Software engineer

Job Description:
- Develop plugins for open-source tools we use in-house.
- Enhance test system UI and reporting

Requirements: Wen development tools (perl, python, ruby, JS, HTML, ...)

Full/Part time position: any

Contact Details: Mike Dubman miked@mellanox.com
Microsoft

Researcher in the field of computer vision and machine learning

Company: Microsoft

Location: Haifa. Group: Advanced Technologies Labs at Microsoft Research Israel

Job Description: Advanced Technologies Labs at Microsoft Research Israel are looking for researchers in the field of computer vision and machine learning. You will join a team developing state of the art algorithms for face recognition, object recognition and tracking, gesture recognition, image processing and more. You will get the opportunity to collaborate and publish with top researchers across Microsoft Research, and transfer technologies to Microsoft products such as Xbox/Kinect.

Requirements:
- The position is intended for MSc or PhD students in Computer Science or Electrical Engineering with focus on computer vision, machine learning or image-processing.
- Research capabilities, with strong theory/algorithum background and very good understanding on how to apply advanced knowledge to solve real problems.
- Fluent in Matlab.
- Good programming skills (C/C++).
- Industry experience is an advantage.

Full/Part time position: Full time for the internship period

Contact Details: ildcjobs@microsoft.com
Please write in the title of your mail: Summer Internship

Research software development engineer

Company: Microsoft. Location: Herzliya. Group: IPE Israel (Bing Mobile)

Job Description: Our group focuses on enabling new mobile experiences! Join us to explore, design and implement algorithm which infer the user’s context on mobile devices. These machine learning algorithms use the raw signals exposed by the mobile OS (accelerometer, gyroscope, microphone, GPS, etc.).
Here are a few examples of inferred context:
1. Detecting mode of transport: Is the user idle, walking, or driving?
2. Understanding what the user is doing based on signals from his microphone.
3. Using the barometer sensor data to estimate altitude.

Come help us push the envelope of mobile computing! Develop production-quality code and experiment with it on your smartphone!

**Requirements:**
- Graduate student in computer science
- Understanding basic machine learning concepts including feature extraction and classification
- Quick learning abilities
- Java + JavaScript knowledge is an advantage
- Experience in Android development is an advantage

**Full/Part time position:** Full time for the internship period

**Contact Details:** ildcjobs@microsoft.com
Please write in the title of your mail: Summer Internship

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**Summer intern in the Azure SQL reporting team**

**Company:** Microsoft. **Location:** Herzeliya. **Group:** BI

**Job Description:** The amount of data over the internet is increasing all the time. How do you take data source, filter the relevant data out of it and convert it into a self-explanatory image that captures its essence?

We will create algorithms that reach to databases available to Open Data Protocol such as Azure Marketplace and find the best ways to query and present them using SQL Azure Reporting.

**Requirements:**
- The position is intended for MSc or PhD students in Computer Science
- Knowledge in data analysis / machine learning
- Strong statistical abilities
- Good coding skills (familiarity with C# and .Net is a plus)

**Full/Part time position:** Full time for the internship period

**Contact Details:** ildcjobs@microsoft.com
Please write in the title of your mail: Summer Internship
Software development engineer intern 1

**Company:** Microsoft. **Location:** Haifa. **Group:** BI

**Job Description:** We’re looking for a highly competent, creative, and hands on graduate intern with machine-learning background for a project that will harness machine learning in favor of gaining insights about cloud services. The industry is shifting to cloud computing and cloud services, and one of the keys to successful cloud services is gaining insights into the massive amounts of data services produce – the SI team is building a system that will provide this for Windows Azure services. As an important and natural next step we’d like to use machine learning techniques for enhancing the level of analysis we do, this is what this project is about.

**Requirements:**
- 2+ years of hands on SW development experience
- 1st and 2nd degrees in computer science
- PhD student in the area of machine-learning or related
- Independence and creativity

**Full/Part time position:** Full time for the internship period

**Contact Details:** Ildcjobs@microsoft.com
Please write in the title of your mail: Summer Internship

Software development engineer intern 2

**Company:** Microsoft. **Location:** Haifa. **Group:** BI

**Job Description:** We’re looking for a highly competent, creative, and hands on graduate intern for creating a cloud service experimentation framework over a distributed storage. The industry is shifting to cloud computing and cloud services, and one of the keys to successful cloud services is gaining insights into the massive amounts of data services produce – the SI team is building a system that will provide this for Windows Azure services. The ability to experiment with the services and compare alternative designs (aka A/B testing) is key to service BI and that’s what this project is about.

**Requirements:**
- 2+ years of hands on SW development experience
- Graduate student in computer science
• Independence and creativity

**Full/Part time position:** Full time for the internship period

**Contact Details:** ildcjobs@microsoft.com
Please write in the title of your mail: **Summer Internship**

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**Summer intern for SQL BI Azure group**

**Company:** Microsoft. **Location:** Herzeliya. **Group:** BI

**Job Description:**

• Web Trace Viewer in Azure – a Web version of the tool that is used by developers to view traces of WAD logs table. Having it hosted in cloud can boost performance of reading traces (reading Azure tables from Azure is faster than reading it from client). The tool allows filtering and grouping logs according to the various trace properties for easy debugging. Possible product application: having this tool will allow OPS to easy reference errors from SCOM to pull all trouble-shooting information by clicking on a link.

• Troubleshooting for Azure - prototype of turning unstructured traces into a structured data for BI processing. Example of scenario: filter “known issues”, finding redundant (replicated) traces; suggesting what traces should be verbose/info/warnings. Possible product application: improving our traces story, prototyping of how it is possible to making trace analysis automatic.

• Performance Analysis tools - Similar to “Troubleshooting” analysis - a prototype of how to analyze “structured” data (events) for performance analysis. Aggregate events that are produced by GW and Engine and split them into statistics of how much time spent in average for every activity. Allow “travelling” and correlating of activities – producing a graph of activities and relations in between. Possible product application: a BI data for further analysis for what performance and usage reports can be achieved from our system.

**Requirements:**

• The position is intended for MSc or PhD students in Computer Science with focus on data mining, machine learning
• Familiarity with development in managed environments (C# or Java)
• Ability to learn quickly new and complex areas
• Good knowledge of networking
• Experience with respect to data mining and business intelligence solutions – an advantage.
Hardware development engineer intern

**Company:** Microsoft.  **Location:** Haifa.  **Group:** AIT- XBox Division

**Job Description:** Advanced Imaging Technologies group (AIT) is part of the Xbox division in Microsoft. It is focused on hardware and software technologies in the Kinect project.

**A few words on Kinect:**
Microsoft’s Kinect for Xbox 360 is the latest motion sensing technology for gaming and entertainment. Instead of a controller, your body becomes the input device. It uses a full body tracking system which is based on 3D sensors and highly sophisticated computer-vision and machine-learning algorithms. Kinect’s aim is to revolutionize the entertainment in the living room. It sold 8 million units in the first 60 days after launch, on its way to become “the fastest-adopted consumer electronic device” (as reported by ReadWriteWeb).

**Responsibilities:** Prototype development.

**Requirements:** The candidate’s mission involves planning and developing new prototypes using cutting-edge computer vision technologies. We are looking for highly motivated, self-learning, independent and creative engineers with the following skills:
- The ability to plan thoroughly and implement new ideas
- Experience with electro-optical devices
- Experience with hardware prototyping
- Knowledge in image-processing
- Good programming skills in Matlab (C++ -- an advantage)

**Full/Part time position:** Full time for the internship period

**Contact Details:** Ildcjobs@microsoft.com
Please write in the title of your mail: Summer Internship
Intel

Building a runtime optimizer using Intel Pin

**Company:** Intel

**Position:** Research and development of a runtime binary optimization tool based on Intel’s Pin Binary Instrumentation technology.

**Job Description:** Constructing a runtime binary optimization tool by extending the Intel Pin tool - a runtime binary instrumentation tool.

The tool collects “light-weight” profiling on the running program, analyzes the frequently accessed functions in the loaded code image of the program and creates new versions of these functions to include optimizations and tuning based on the gathered profile and the platform it is running on. The original function calls are then redirected to the new optimized functions.

**Requirements:** Compilers course, Assembly course.

**Part/Full time position:** Full time for summer.

**Contact Details:** Einat Keren, Einat.keren@intel.com

Parallel computing research 1

**Company:** Intel

**Position:** Parallel computing research

**Job Description:** OpenCL is a new open standard for parallel computing on heterogeneous devices like multi-core CPU, GPU and other accelerators.

**Project 1**

The candidate will take an existing benchmark and analyze different ways to parallelize and optimize the benchmark through OpenCL on Intel latest platforms. Following this analysis stage, the candidate will implement the benchmark using OpenCL. The goal is to maximize the benchmark performance on OpenCL on Intel platforms, through high multi-core and vector instructions utilization.
**Project 2**
The candidate will develop a tool to capture a trace of API calls to low-level device driver of an accelerator device, during OpenCL application execution. The goal is to be able to playback this trace (or specific parts of it) for debugging and testing purposes.

**Project 3**
The student will
1. Develop OpenCL workloads to run in a hybrid (parallel) fashion on CPU and GPU. Highest priority would be given to image processing and video transcoding algorithms. However, the student can also suggest interesting algorithms from other domains which are good candidate for data-parallel computations with OpenCL.
2. Explore different dynamic load balancing methods to divide the work efficiency between a CPU device and a GPU device.
3. Perform power/performance analysis of these load balancing applications using advanced performance tools.

**Requirements:**
- Good C/C++ design and coding skills.
- High motivation to quickly learn and use new programming model.
- Background in performance analysis is an advantage.
- Background in parallel computing and interdisciplinary domain with relevant algorithms can be an advantage.

**Full/Part time position:** Full time for at least 3 months

**Contact Details:** Einat Keren, Einat.keren@intel.com

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**Development and practical research in constraint programming**

**Company:** Intel

**Position:** Development and practical research in Constraint Programming: improvement of CP solution search explanation techniques. (Constraint Programming is a very popular approach of general problem representation and solving, successfully used for a vast number of hard problems; it is also the core engine of Test Generation solution in the industry, e.g. Intel, IBM, Cadence, etc.) The development will be part of a Test Generation tool that is being used worldwide by multiple leading projects in Intel.

**Job Description:** Developing an algorithm and implementing a working prototype in C++. The development will focus on implementing heuristic explanation methods for cases
when a problem solution cannot be found by the CP solver, in the context of the test generation problem.

**Requirements:** Motivation for leading a practical research; fast learning; knowledge in algorithms and complexity; experience in C++. Advantage for students with background in AI and CP or SAT/SMT.

**Full/Part time position:** Full time for summer.

**Contact details:** Inbal Netser, Inbal.netser@intel.com

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**Software developer 1**

**Company:** Intel

**Position:** Software Developer

**Job Description:** In this position you will work on porting an architectural simulator from x86 to another architecture. This includes handling complex mathematics, inline assembly, and performance analysis. The final result should be an architecture-independent simulator.

**Requirements:** Good working knowledge in C. Ability to quickly ramp on new domains, interest in assembly language, high motivation.

**Full/Part time position:** Full time, summer internship.

**Contact Details:** Inbal Netser, Inbal.netser@intel.com

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**Software developer 2**

**Company:** Intel

**Position:** Software Developer

**Job Description:** In this internship, you will create a tool to generate automatic Architectural specifications/models from an x86 simulator. The specification can then be used to understand instruction semantics, validate architectural behaviors, test generation, etc.
**Requirements:** Good knowledge of the C language. Highly independent, able to quickly ramp on new domains.

**Full/Part time position:** Full time, summer internship

**Contact Details:** Inbal Netser, Inbal.netser@intel.com

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**Parallel computing research 2**

**Company:** Intel

**Job Description:** OpenCL is a new open standard for parallel computing on heterogeneous devices like multi-core CPU, GPU and other accelerators. The candidate will take an existing benchmark and analyze different ways to parallelize and optimize the benchmark through OpenCL on Intel latest platforms. Following this analysis stage, the candidate will implement the benchmark using OpenCL. The goal is to maximize the benchmark performance on OpenCL on Intel platforms, through high multi-core and vector instructions utilization.

**Requirements:**
- Good C/C++ design and coding skills
- High motivation to quickly learn and use new programming model
- Background in performance analysis is an advantage
- Background in parallel computing will greatly help

**Full/Part time position:** Full time for at least 3 months

**Contact Details:** Einat Keren, Einat.keren@intel.com
Cloud computing

Company: IBM

Job Description: Cloud computing [1] is the delivery of computing as a service rather than a product, whereby shared resources, software, and information are provided to computers and other devices as a utility (like the electricity grid) over a network (typically the Internet). Cloud Computing provides computer services, software applications, data access, data management and storage resources without requiring cloud users to know the location and other details of the computing infrastructure. Cloud Computing is made possible, among other means, by advanced virtualization and system management technologies.

The goal of the project would be to explore the use of novel system virtualization technologies (including server, storage and network) to develop next-generation Cloud Computing environments. The focus of the work is on the IaaS (Infrastructure as a Service) level. The project may involve work on open source virtualization and cloud technologies, such as KVM and Open Stack [2]. The intern will join an IBM research team [3] which works on a variety of systems research projects, interfacing with both IBM product and service units and with the European academic research community.

References:

We offer: An opportunity to work and conduct high-quality research in one of the world's leading research groups in the area of Systems Research on a topic that is in the bleeding edge of research and technology – Cloud Computing.

Requirements: Good research and self-learning skills, excellent programming skills with a passion for systems/storage/network research and, preferably, to system internals.

Full/Part time Position: Summer internship

Contact Details: please apply on line: https://www.research.ibm.com/haifa/careers.shtml
System optimization and quality

Company: IBM

Job Description: Emerging enterprise workloads and new business models demand increased agility and responsiveness from the supporting IT infrastructure. Whether it’s structured transaction records or unstructured content like email, voice and video, businesses are challenged to keep up and make sense of it, often facing a limited and un-optimized infrastructure that lead to IT sprawl and complexity. This situation is playing out against a background of harsh financial reality, where there is considerable pressure on IT managers to rein in costs. The way out is to leverage a smarter computing architecture to create a virtuous cycle, with IT infrastructures that are designed for data based on optimized systems that are tuned to the task and managed as a cloud. Smarter can deliver superior business outcomes and increased service levels with reduced costs, by taking advantage of high-performance system software technology and more productive, streamlined systems management.

The goal of the project would be to explore the use of novel system optimization technologies in modern, highly virtualized data centers. We address the notion of system optimization in the widest sense, including performance analysis and tuning of system software, functional defect elimination, means to enhance software quality and algorithmic approaches to development of highly optimized system configurations (among others). The intern will join an IBM research team [1] which works on a variety of systems optimization projects, interfacing with both IBM product and service units and with the European academic research community.

We offer: An opportunity to work and conduct high-quality research in one of the world's leading research groups in the area of Systems Research on a topics that is in the bleeding edge of research and technology – Smarter Computing

References:

Requirements: Good research and self-learning skills, excellent programming skills with interest in performance optimization and/or software quality.

Full/Part time Position: Summer internship

Contact Details: Please apply on line - https://www.research.ibm.com/haifa/careers.shtml
Researcher on event-based decision management under uncertainty

Company: IBM

Job Description: A current observation is that by 2015 80% from the data in the universe will be in form of streaming data (events) and will have some kind of uncertainty associated with them. Since real-time decisions are required in many applications, traditional solutions of data cleansing prior to processing will not work and there is a need to develop new methods and schemes to represent, handle, visualize and make decisions based on events that have various types of uncertainties: uncertainty about the happening of the event, completeness of event stream, the timing of the event, the location of the event, the content of the event, and the validity of the event patterns. The research deals with all aspects of event-based decisions under uncertainty, including: knowledge representation, reasoning, uncertainty propagation, uncertainty removal, and uncertainty visualization using both analytical methods and simulation-based methods. It also deals with effect of uncertain event-based decisions on business process management,

We offer: an opportunity to work and conduct high-quality research in one of the world's leading research groups in the area of uncertainty on a topic that is in the bleeding edge of research and technology, with leading researchers in various areas (event processing, simulation and visualization).

Requirements: Good research and self-learning skills, excellent programming skills including knowledge of Java and Web programming. Prior acquaintance with event processing and business process management is a plus.

Full/Part time Position: Summer internship

Contact Details: Please apply on line - https://www.research.ibm.com/haifa/careers.shtml

Summer internship

Company: IBM

General background: High-end, high-performance processors are designed to work in very high frequencies, leading to a very short cycle times. In such designs, adhering to timing constraints is a particularly difficult challenge, which logic designers are required to deal with from the early stages of the RTL (VHDL or Verilog) implementation. Consequently, the process of timing closure, which involves analyzing, debugging and
fixing timing issues, is a regular part of the logic designers’ work. In a reality where designs sizes are getting increasingly larger while time to market is constantly shrinking, the need to shorten the design cycle is becoming more acute than ever. In particular, timing closure is a very time-consuming task, thus better methods and automated techniques which can facilitate this process are required.

**Job description:** The goal of the project is to research and develop methods which will assist logic designers with localizing and fixing errors related to timing problems. This will involve gathering and analyzing data produced by logic synthesis tools, which can be utilized to guide the logic designer in pin-pointing possible causes of the timing problems. For example, identifying cases where the design or parts of it, are over-constrained. Additionally, methods for correlating post synthesis data back into the higher-level code representation will be explored. The results of this research will be documented in a paper which will be submitted to a top design automation conference and/or a relevant journal.

**Requirements:**
- Logic and logic design
- Background in electrical engineering is recommended
- Good C/C++ programming skills

**Contact Details:** Please apply online [https://www.research.ibm.com/haifa/careers.shtml](https://www.research.ibm.com/haifa/careers.shtml)

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**Researcher at the business optimization group**

**Company:** IBM

**Job Description:** Around the world, it is becoming more and more challenging to provide water at the required quantity and quality, while maintaining equitable costs. On the one hand, demand rises as the population grows, while on the other, most distribution networks operate poorly due to their aging physical infrastructure with significant leakage rate, manual operation, and limited or no real-time information.

As part of IBM’s vision for a smarter planet, the business optimization group is developing real-time and off-line optimization algorithms that make the water distribution supply chain more sustainable. Our work is intended to proactively enhance and optimize the performance of the water distribution network by aggregating data coming from different sources, studying the current state of the system, and predicting future needs and events.

Such optimizations are made possible by using advanced mathematical algorithms that can explicitly take into account the complex objectives and constraints of water distribution systems, including the hydraulic aspects, and intelligently consider possible
alternatives. Ultimately, the optimizations can present solutions that far surpass the capabilities of unaided human decision makers. The summer internship would explore the relationships between the dynamic stochastic demand and the resulting pressure in the network, as over pressure is one of the main resources for bursts, and under pressure is poor level of service. We offer: an opportunity to work and conduct high-quality research in a leading applied Operation Research group on a challenging Smarter Planet physics meets digital topic.

**Requirements:** Independent and motivated, with background in statistics, simulation and optimization.

**Full/Part time Position:** Summer internship

**Contact Details:** Please apply on line

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**Researcher at the collaborative multimedia services team**

**Company:** IBM

**Job Description:** The project will focus on the development of a robust real-time video analytics algorithm for either motion detection or object tracking. The constraints are such that both the objects and the camera may be moving (independently), and that the camera is not necessarily in the physical proximity of the target object(s).

The goal of the project would be to build a system that can provide high quality (low level of false alarms) analytics, taking performance constraints into consideration so that it could be applied in real-time.

**We offer:** An opportunity to work and conduct high-quality research in one of the world's leading research groups in the area of Multimedia/video Technologies on a topic that is in the bleeding edge of research and technology.

**Requirements:** Good research and self-learning skills, excellent programming skills including knowledge of Java and Web programming.

**Full/Part time Position:** Summer internship

**Contact Details:** Please apply on line
Researcher at the information retrieval group

Company: IBM

Job Description: During this project we shall develop a new type of a web crawler: "Social-Focused Crawler". Traditionally, opposed to regular web crawlers whose aim is to discover any resource on the web in a timely manner; a focused crawler tries to discover only resources that are relevant to specific topics or similar to its seedlist. A social focused crawler shall further leverage social data for the discovery of relevant resources. In such a setting, social entities such as users, tags, and their relationships can be utilized for expanding the crawler's discovery frontier and enhanced its educated decisions.

The main challenges for a social focused crawler are:
• Develop new classification methods for focused crawling based on social data.
• Develop new crawl scheduling algorithms based on large scale social data.
• Develop evaluation schemes for social focused crawler.

References:
[2] Exploiting Tags and Social Profiles to Improve Focused Crawling, Zhang et al. (WI-IAT 2009)
[3] Predicting Author Blog Channels with High Value Future Posts for Monitoring, Shanchan et al. (AAAI 2011)

We offer: An opportunity to work and conduct high-quality research in one of the world's leading research groups in the area of Information Retrieval on a topic that is in the bleeding edge of research and technology.

Requirements: Good research and self-learning skills, excellent programming skills including knowledge of Java, Web programming and Hadoop/Nutch (advantage).

Full/Part time Position: Summer internship

Contact Details: Please apply on line

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Researcher at the social media and web 2.0 technologies group

Company: IBM

Job Description: Real-time information streams that include status updates (as in Twitter and Facebook News Feed) and social activities (such as bookmarking, blogging, sharing a file, or updating a wiki) are becoming ubiquitous both on the Web and within
the enterprise. Attention management is becoming one of the greatest challenge as users who consume these information streams are exposed to information overload and desire to get the most relevant and attractive pieces. The goal of the project would be to build a system that collects and analyses information that can be useful for building a user profile (topics of interest, people of interest, etc.). We will compare several user modeling techniques through a social dashboard that would present enhanced attention management through a more relevant stream for the user. The intern will be exposed to UI and backend technologies such as Ajax, REST APIs, Atom, JSON, Lucene, and more.

References:
[1] Short and Tweet: Experiments on Recommending Content from Information Streams – Chen et al. (CHI 2010)
[2] Personalized Recommendation of Social Software Items based on Social Relations – Guy et al. (RecSys 2009)
[3] Social Networks and Discovery in the Enterprise (SaND) – Ronen et al. (SIGIR 2009)

We offer: An opportunity to work and conduct high-quality research in one of the world’s leading research groups in the area of Social Technologies on a topic that is in the bleeding edge of research and technology.

Requirements: Good research and self-learning skills, excellent programming skills including knowledge of Java and Web programming.

Full/Part time Position: Summer internship

Contact Details: Please apply on line

Researcher at the social media and web 2.0 technologies group – reputation and influencer systems

Company: IBM

Job Description: Detecting influence and reputation has become a key challenge in the era of the social web. Services such as Klout and Topsy try various approaches to deal with this challenge, which is hard not only from an analysis perspective, but also for evaluation. The literature on the topic is relatively sparse, especially when it comes to utilizing the public signals in social media to infer reputation and influence. In this proposed project, we will investigate reputation and influence in the enterprise. We intend to examine a variety of social media applications and relationships as indicators for reputation. Some of these indicators are content-driven (blog commenting, file downloading) and some are directly related to the person (following,
We also wish to explore the suitability of link analysis graph algorithms over social networks for the reputation detection problem. Finally, we will develop a novel method to evaluate our different combinations of data signals and graph algorithms.

We offer: An opportunity to work and conduct high-quality research in one of the world's leading research groups in the area of Social Technologies on a topic that is in the bleeding edge of research and technology. The intern will be exposed to exciting areas of research such as data mining and graph algorithms and will work with the team that developed the SaND technology that stands behind the social analytics engine of IBM Connections, the market-leading enterprise social software product. We expect to produce a scientific paper out of this project to be submitted to a top quality conference. In the longer run, we hope that our findings will power IBM social software line of products.

Requirements: Good research and self-learning skills, excellent programming skills including knowledge of Java and Web programming. High motivation to cope with research as well as engineering challenges.

Full/Part time Position: Summer internship

Contact Details: Please apply online

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Researcher at the social media and web 2.0 technologies group

Company: IBM

Job Description: Online communities have become very popular both in the internet as well as the enterprise intranet. Communities within the intranet are used for various purposes such as knowledge and expertise sharing, collaboration, idea generation and more. Especially large enterprises such as IBM have a lot of content created which might be related to the community's topics and interests but due to information overload might be hard to discover. A recommendation service that would automatically identify a community's interest profile and based on that recommend relevant content to the community's members would be of high value. The goal of the project would be to build a system that collects and analyses information from enterprise social media to generate recommendation to enterprise communities based on a community's interest profile. The recommendations would be exposed to community owners and members who would rate or expose those in their communities. We would then follow the impact of such recommendations on the
community health and activity considering different recommendation generation algorithms. The intern will be exposed to UI and backend technologies such as Ajax, REST APIs, Atom, JSON, Lucene, and more.

References:
[1] Personalized Recommendation of Social Software Items based on Social Relations – Guy et al. (RecSys 2009)
[2] Social Networks and Discovery in the Enterprise (SaND) – Ronen et al. (SIGIR 2009)

We offer: An opportunity to work and conduct high-quality research in one of the world’s leading research groups in the area of Social Technologies on a topic that is in the bleeding edge of research and technology.

Requirements: Good research and self-learning skills, excellent programming skills including knowledge of Java and Web programming.

Full/Part time Position: Summer internship

Contact Details: Please apply online -

Consumable analytics for multi-criterion decision making problems

Company: IBM

General Background: Decision makers are often required to account for multiple conflicting objectives upon selection of a solution for their problem, overall resulting in a potentially large number of candidate solutions to consider. As the number of options is too large to be explored by a human, and decision makers aspire to examine a limited set of options. Towards this end, a smaller set of optimal solutions, called the Pareto Frontier of the problem, is provided as output by means of an optimization process.

Job Description: A crucial part of the effort to study the conflict of a given multi-objective problem at hand is to explore its attained Pareto Frontier by means of visual analytics. Towards this end, investigation of the existing state of the art visual analytics encoding, interactions and algorithms is needed, in addition to free-style thinking to yield novel approaches. Such innovative approaches are to engage in the posteriori phase of decision making that follows the optimization phase. Implementation would involve the latest Web2.0 technologies.

We offer: We offer exploratory Research project possibly leading to a scientific publication in addition to participating in developing a novel solution with a clear productization roadmap.
**Requirements:** Strong background in Visual Analytics and Neural Networks is an advantage

**Full/Part time Position:** Full time student position for the summer period

**Contact Details:** Please apply on line - [https://www.research.ibm.com/haifa/careers.shtml](https://www.research.ibm.com/haifa/careers.shtml)
For additional info contact: davida@il.ibm.com

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**Decision making in conflicting multi-criterion problems**

**Company:** IBM

**General Background:** Multi-Criterion Decision Making is a growing interdisciplinary field that primarily involves research from the domains of Computer Science, Operations Research, and Visual Analytics. It addresses questions in multi-objective optimization, decision making theory, visualization, and Game Theory. As an increasing volume of real-world problems are formulated and solved as multi-objective problems, tackling open questions in decision making is much needed.

**Job Description:** Design and implement efficient algorithms for automated analysis of Pareto frontiers and for assisting the human-driven decision making process. Incorporate your solution with an existing environment of optimization and consumable analytics in state-of-the-art technologies (Java, Web2.0 Javascript\Dojo).

**We offer:** We offer exploratory Research project possibly leading to a scientific publication in addition to participating in developing a novel solution with a clear productization roadmap.

**Requirements:**
- Strong algorithmic background
- Experience in Data Mining and Machine Learning is an advantage
- Background in Game Theory and Economics is an advantage

**Full/Part time Position:** Full time student position for the summer period

**Contact Details:** Please apply on line - [https://www.research.ibm.com/haifa/careers.shtml](https://www.research.ibm.com/haifa/careers.shtml)
For additional info contact: davida@il.ibm.com
Robust multi-objective optimization

Company: IBM

General Background: Practical problem-solving is imposed to uncertainty at several possible levels. In particular, real-world optimization problems are typically subject to uncertainty at both the Design Space as well as the Objective Space. Traditional Robust Optimization treats uncertainty within the single-objective optimization framework, whereas addressing multi-objective optimization still possesses underlying open questions.

Job Description: Explore state-of-the-art Robust Optimization approaches, and design novel approaches for tackling challenging real-world multi-objective optimization problems that are currently under investigation.

We offer: We offer exploratory Research project possibly leading to a scientific publication in addition to participating in developing a novel solution with a clear productization roadmap.

Requirements:
- Strong algorithmic background
- Experience in Operations Research and Optimization

Full/Part time Position: Full time student position for the summer period

Contact Details: Please apply on line - https://www.research.ibm.com/haifa/careers.shtml
For additional info contact: davida@il.ibm.com

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Collaborative multi-objective decision making

Company: IBM

General Background: Multi-Criterion Decision Making is a growing interdisciplinary field that primarily involves research from the domains of Computer Science, Decision-making, and Visual Analytics. It addresses questions in multi-objective optimization, decision making theory, visualization, and Game Theory. As an increasing volume of real-world problems are formulated and solved as multi-objective problems, tackling open questions in decision making is much needed.

Job Description: Investigate existing methods for group decision making in general, and for multi-objective problems in particular. Design and implement novel methods for supporting the decision process in a group/ crowd. Incorporate your solution with an
existing environment of optimization and consumable analytics in state-of-the-art technologies (Java, Web2.0 Javascript\Dojo).

We offer:
  We offer exploratory Research project possibly leading to a scientific publication in addition to participating in developing a novel solution with a clear productization roadmap.

Requirements:
  • Strong background in Game-and Decision-making theories
  • Background in Web2.0 technologies (Javascript, Dojo).

Full/Part time Position: Full time student position for the summer period

Contact Details: Please apply on line -
For additional info contact: davida@il.ibm.com
Qualcomm

Software developer

Company: Qualcomm Israel

Job Description: Software developer, testing, vi developer

Requirements: Coding experience in C, C++ or C#, knowledge in operating system and hw/sw interfaces

Full/Part time position: either option

Contact Details: my_career@qualcomm.com