## Summer Internships 2012

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Marvell

CLI (Cisco like command-line-interface, luaCLI) development on top Marvell switching driver APIs

Company: Marvell Israel. Location: Petach Tikva

Job Description: We are looking for highly motivated, first of second year computer since student. The development requires understanding of switching/routing features and protocols, ability to analyze requirement CLI implementation, LUA script language. The development includes definition analysis, design, implementation and auto-verification of new CLI commands for the following features – STP, tunneling, diagnostics, etc.

Requirements: C, Data communication, Operation System. Script languages (python, lua, ruby, etc) – an advantage

Full/Part time position: Full time / 3 months

Contact Details: internship-il@marvell.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
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

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**Development of SW tool for current consumption control at the Cellular- Communication infrastructure and testing team (DSPV system validation)**

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

**Job Description:** The purpose of this project is to develop a PC application that will analyze the power consumption of the main chip in cellular phone on IDLE mode by the following specifications:

The project requirements are to receive a file that summarizes number of cellular phone power consumption sampling in IDLE status. With the use of advanced algorithm, we can identify which RAT is in process and the number of neighboring measured processes. We can also identify if the source of each “awakening” is caused by the COMM or the APPS, and by that to provide feedback regarding the number of actual “awakenings” for each. The application will use friendly GUI, will implement the algorithm and will provide detailed report. The application will be developed to advance the power consumption analysis as required.

**Requirements:**
- Experience with C/C++
- OO development experience
- Basic knowledge in Algorithm and DB

**Full/Part time position:** Full time- 3 months
Switching architectural simulations development

Company name: Marvell

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

Research and Development of EPON OLT DBA algorithms, considering several system (SW&HW) architectures

Company name: Marvell Israel. Location: Petach Tikva

General background: A Passive Optical Network (PON) is a point-to-multipoint, fiber to the premises network architecture in which unpowered optical splitters are used to enable a single optical fiber to serve multiple premises, typically 16-128. A PON consists of an optical line terminal (OLT) at the service provider’s central office and a number of optical network units (ONUs) near end users.

The OLT is responsible for allocating upstream bandwidth to the ONUs. Through Dynamic Bandwidth Allocation (DBA), a PON can be oversubscribed for upstream traffic, according to the traffic engineering concepts of statistical multiplexing. The OLT polls ONUs for their queue status and grants bandwidth using the MPCP GATE message. Then, using various DBA algorithms the OLT prepares a TDM map of transmission slots per ONU per service, taking into account the ONU reports and priorities.
EPON ("Ethernet PON"), is a IEEE 802.3ah standard, describing a PON protocol up to 1Gbps full-duplex. A second generation, IEEE 802.3av, allows up to 10Gbps full-duplex.

**Job Description:** Learning and comparing existing DBA algorithm. Developing new algorithm and architecture (SW&HW), and analyzing performance through simulation modeling.

**Requirements:** Knowledge in programming (Op-Net/Matlab). Networking background is an advantage.

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

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

Company: Mellanox

Position: Software Development

Job Description: Develop a user representation of a network model from data in log and model text files. Requires parsing the text files and displayed a layered information model (preference is to have the representation in visio)

Requirements: Software developer, knowledge in VB/VBA

Full/Part time position: both are possible

Contact Details: Nati Merfish, natim@mellanox.com

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
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

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
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
Company: Orbitz Israel

Job Description: Create set of tools that automate the creation of a user interface which would be a single entry point for looking up all services by host, and to allow a human interface for issuing requests upon those services.

The project is made of two major components:
1. Auto discovery of all services running on all hosts in each environment (Dev/FQA’s/Staging/Production).
2. Auto generation of web-gui out of a service definition, that allows services discovery, invocation and visualization of results

Requirements: In order to generate Web pages driven by a Java backend, the following requirements are needed:
1. Experience with the Java programming language
2. Web experience

Full/Part time position: Full time position

Contact Details: Yori Landau (yori.landau@orbitz.com)