## Summer Internships 2013

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Microsoft

**Machine learning / Big Data analytics applied research student**

Company: Microsoft  Location: Herzeliya

**Group:** ILDC Big Data Incubation Group

**General background:** The Big Data Incubation Group at Microsoft’s Israel Development Center is a start-up spirited, small research and engineering team focused on incubating new, innovative offerings that will be at Microsoft forefront in the big data and cloud era.

We are offering graduate students the opportunity to work as a team on cutting-edge, real-world applied research problems. The interns will participate in scoping the problems in the context of the product, business and user experience challenges at hand, giving them an opportunity to influence the next generation of Microsoft products.

**Responsibilities:** Contribute to ideation, scoping, and definition of research problems; Conduct independent and team research; Prototype algorithms and experiment on large amounts of real-world data; Collaborate with engineers on feature implementation.

**Requirements:**
- PhD/MSc student, researching a data-related topic.
- Strong programming skills (Java/C++/C#).
- Algorithm development skills.
- Background in Recommender Systems or other Machine Learning or Data Mining areas – a strong advantage.

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

To apply for this position click [here](#)

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**Researcher student in the field of computer vision and machine learning**

Company: Microsoft  Location: Haifa

**Group:** Advanced Technology Labs at Microsoft Research Israel

**General Background:** Advanced Technology Labs at Microsoft Research Israel are looking for researchers in the field of computer vision and machine learning.
Responsibilities: 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 and PhD students in Computer Science or Electrical Engineering with focus on computer vision, machine learning or image-processing.
- Research capabilities, with strong theory/algorithm background and very good understanding on how to apply advanced knowledge to solve real problems.
- Fluency in Matlab.
- Good programming skills (C/C++).
- Industry experience is an advantage.

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

To apply for this position click here

Software development engineer student 1

Company: Microsoft   Location: Herzeliya

Group: Online Services Division (Recommendations Platform Team)

General Background: The Bing Information Platform team is building a platform offering transformative experiences to leverage the world’s knowledge through natural interface. We are building a world-class team of developers to build the platform and experiences that defines next generation of innovation. We will stop at nothing short of changing the world.

Responsibilities: The Israeli branch of the Bing Information Platform builds services that enable personalized user experiences across Microsoft’s products, based on data driven recommendations. Our services are powered by architecture and algorithms that process terabytes of data and respond within milliseconds.

Requirements:
Position is open to all B.Sc. /M.Sc. /Ph.D. students in Computer Science or similar area, with past development experience of complex large scale systems (C# knowledge is preferred).

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

To apply for this position click here
Software development engineer student 2

Company: Microsoft   Location: Herzeliya

Group: Online Service Division (Personal Data Platform)

General Background: The Israeli branch of OSD is responsible for providing personalized user experience, based on data driven recommendation and optimization platform and engines, while preserving privacy essentials.

The newly emerging personal data platform provides the underlying storage for all user data, as such being a fundamental component for the entire OSD.

Our environment includes large scale software systems that perform heavy duty processing and serving in a distributed computation environment while integrating with other systems and devices.

Responsibilities: We are looking for exceptional, passionate interns, who are keen to learn and have and extensive hands on experience with the cutting edge technologies available today.

Requirements:
- MSc./BSc. Students of Computer Science or Software Engineering, 2nd year or above, GPA 80+
- Strong programming skills, driven by quality and engineering best practices
- Tech enthusiast with passion for technology, mobile and web apps
- Developed a working service/app/prototype, even if just for fun (Advantage)
- C#, .NET and MS development environment/tools (Advantage)

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

To apply for this position click here

Data science student 1

Company: Microsoft   Location: Herzeliya

Group: BI

General background: Our team is working on a BI cloud service. The project includes end to end scenarios from Office 365 and also uses as a foundation to other BI
scenarios. The team is part of the ILDC BI organization that owns the cloud part of the 1.5B$ MS BI business.

**Responsibilities:** This position offers the opportunity to be part of a challenging and innovative project that combines cutting-edge technologies of advanced data analysis, of cloud services, and of interactive UX into a powerful and exciting product. The position also offers the opportunity to be part of an agile, strong, and successful engineering team.

We’re looking for an M.sc/Ph.D. intern with knowhow/experience around data science to help us build the right BI solution for our customers, as well as drive up its quality (e.g. through telemetry data analysis, etc.).

**Requirements:**
- M.Sc. / Ph.D. in Computer Sciences / Mathematics.
- Background in machine learning, statistics, data mining.
- Strong analytical abilities and an “attitude for data”.
- Experience in working with “real” data is an advantage.
- Team player – ability to communicate and cooperate with others.

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

**To apply** for this position click [here](#)
around data science to help us build the right BI solution for our customers, as well as drive up its quality (e.g. through telemetry data analysis, etc.).

**Requirements:**
- M.Sc. / Ph.D. in Computer Sciences / Mathematics.
- Background in machine learning, statistics, and data mining.
- Strong analytical abilities and an “attitude for data”.
- Experience in working with “real” data is an advantage.
- Experience in data-mining algorithms is an advantage.
- Team player – ability to communicate and cooperate with others.

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

**To apply** for this position click [here](#)
Implementation of parallel min-cut/max-flow algorithm for large graphs which are sub-sets of a regular 3D grid

Company: Philips Healthcare

General Background: Although several designs of parallel min-cut/max-flow algorithm are available, there is no implementation that can be integrated in our product, due to various reasons.

Responsibilities: Production-quality implementation of parallel min-cut/max-flow algorithm for large graphs with maximal speed-up and minimal memory consumption.

Requirements: Basic algorithmic skills

Full/Part time position: both

Contact details: Mark Rabotnikov, email: Mark.Rabotnikov@philips.com

References:
Company: IBM Research Labs – Haifa

General Background: The state-of-art design of computer processors targets high-performance operation under tight limitations of power consumption. The demand for high-speed and low-power operation dictates complex design flows to satisfy these, commonly contradicting, requirements. Most of the design is implemented using automatic tools that translate the logic description in RTL languages to the actual scheme of interconnected logic gates. This is done by variety of tools performing synthesis, placement and routing of the gates. However, some of the resulting logic paths have high delay and cause bottleneck, limiting the overall chip performance. These critical paths pull significant design and optimization efforts, and have major impact on overall power consumption due to measures required to reduce the delay. In order to battle these issues, tools are required that will be able to significantly improve the performance and power consumption of the chip, with minimal changes to the existing design.

Project Description: The goal of the project is to research and develop novel technologies which will allow performance improvement and power reduction in the design. The optimization techniques are based on logic transformation which should improve the timing of critical paths with minimal changes to the design. The work will involve gathering and analyzing data produced by logic synthesis tools, which will be used for identification of optimization opportunities, analysis for selection of best candidate paths and the related transformations, and applying of the transformations to selected logic paths. The impact of the applied techniques on timing and power will be analyzed. Additionally, the new techniques will be compared to the existing optimization methods in synthesis flow. 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.

Required Skills:
- Logic and logic design
- Background in electrical engineering is recommended
- Good programming skills
- Graduate student is preferred. Outstanding undergraduate can also apply

Position: Full time summer internship.

Contact Details: Arkadiy Morgenshtein, arkadiym@il.ibm.com
R&D of a Memory Model Testing System

Company: IBM Research Labs – Haifa

General Background: The memory model is a significant part of any modern computer architecture. Simply put (and with some loss of accuracy), the memory model is a set of rules by which one can compute whether a multi-threaded program can terminate at some state.

Take this program for example:

<table>
<thead>
<tr>
<th>Initial state: x=y=0</th>
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<tr>
<td>Thread 0</td>
</tr>
<tr>
<td>x=1</td>
</tr>
<tr>
<td>y=1</td>
</tr>
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Is it possible for thread 1 to read 1 from y, but 0 from x? The answer depends on the memory model.

The Power and ARM architectures rely on the weak memory model. This model guarantees "very little", thus enabling high performance for multi-threaded programs.

Testing systems for their compliance with the memory model is a tough and challenging task. Much research has been invested in this area, but with the growing complexity of the memory models (in light of, for example, transactional memory) there’s much more to be done.

Project Description: The goal of the project is to augment a system developed in Cambridge by adding to it, multiple aspects affecting system behavior under a given test. These include, for example, the placement of the test in memory, address selection, thread selection, etc. For all of these, and more, intelligent, pseudo-random selection is required to ensure the overall quality of the test suite.

Required Skills:
• Good programming skills
• Knowledge and understanding in parallel and distributed systems is an advantage.
• Graduate student is preferred. Outstanding undergraduate can also apply

Position: Full time summer internship.

Contact Details: Amir Nahir, nahir@il.ibm.com
**R&D on intersecting test-cases to facilitate effective debug**

**Company:** IBM Research Labs – Haifa

**General Background:** In the process of hardware development, we leverage random test-case generation tools to create random tests to stimulate the design. When debugging failures, we often require multiple failing test-case instances to find the root cause of a bug. These are test-cases generated from the same template, with slight differences between them (originating from the random nature of the test-generator).

In many cases, we find ourselves reading multiple failure reports for similar tests, trying to determine the commonality between them in order to create a short test which triggers the bug.

**Project Description:** The goal of the project is to add meta-data tracking the choices the test-generator makes, and to automate the process of intersecting failing test-cases to find their commonality.

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.

**Required Skills:**
- Good programming skills
- Graduate student is preferred. Outstanding undergraduate can also apply

**Position:** Full time summer internship.

**Contact details:** Amir Nahir, nahir@il.ibm.com
Company: Amdocs

General Background: Amdocs Customer Management (CM) division is offering full line of products for customers’ management. The rise of big data in general and in telecommunication arena specifically, brings new exciting opportunities, together with big challenges.

Project Objective: Using machine learning and data mining techniques, such as statistical NLP (Natural Language Processing), we’re looking for insights regarding customers’ behavioral patterns within text sources.

Responsibilities: Developing a complete Proof of Concept (POC) project, including a complete data mining cycle, from data collection, via features selection and designing and implementing a machine learning model to real life data. This is an extraordinary opportunity to conduct a complete machine learning research project to a real life problem. A successful POC will be implemented within our product.

Requirements:
• Theoretical background
  o Probabilistic reasoning - a must;
  o Statistical NLP – a must;
• Programming skills
  o Either Java or R – an advantage
  o Experience with Text Analytics open source packages – an advantage

Full/Part time position: Full or part time position, at least three days a week for three months.

Contact Details: Gilad Barkan Gilad.Barkan@amdocs.com 09-7761234, 052-8944566

Mobile cell site process analysis and prediction

Company: Amdocs

General Background: Amdocs OSS division is offering a product for managing the operators’ complex procedure of cell site deployment. This includes site visits, radio parameters setup, different authority’s approval etc. In total there are around 200
processes involved for a single site rollout, where a customer can reach hundreds of sites per day.

Project Objective: Using a Bayesian network probabilistic approach, and running over sample data, students should develop software that can “learn” the behavior of processes in mobile build environment. After assigning different probabilities to the nodes in the Bayesian net, different queries might be supported, for example what are the net effect of adding a new process in the chain – in time and operational costs.

**Responsibilities:** Develop the probabilistic engine, possibly using Amdocs licensed tools (Netica). The engine should have a continuous learning process, thus updating its internal Bayes network. The engine should expose standard interface to answer network related queries.

**Requirements:** Programming skills in Java is a must, probability and probabilistic reasoning background is a must, genetic algorithms background is an advantage.

**Full/Part time position:** Full or part time position, at least two days a week for three months.

**Contact Details:** Dani Livne Dani.Livne@amdocs.com 09-7786313, 052-4474243

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**Enterprise Performance Management Researcher 1**

**Company:** Amdocs

**General background:** Amdocs is a leading company in delivering software for telecommunication providers around the globe. Knowing the early signs for software delivery can be a top managerial tool.

**Responsibilities:** Our objective is to analyze the past results of Amdocs’ delivery projects that were marked as in risk by their managers, identify variables that could have alert on a risk before the manager raised it, create a prediction model for risks from which we can draw recommendations and warnings.

Amdocs will supply:
- Vast database with relevant parameters’ measurements over time.
- Professional consulting of project managers, business background and interviews
- Office, computer and analysis tools.

**Requirements:**
Intensive applied mathematics background (Phd. prefered) in performance or statistical analysis. Knowledge in risks management is an advantage
Full/Part time position: Either full time or part time, for 3 months at least, in Amdocs office in Raanana.

Contact Details: Gilli Shama, gillis@amdocs.com 09-7786214

Enterprise Performance Management Researcher 2

Company: Amdocs

General background: Amdocs is a leading company in delivering software for telecommunication providers around the globe. A software delivery project starts in defining the scope of solution.

Responsibilities: Our objective is to analyze the past results of Amdocs’ solution scoping, identify variables that may affect it, create a prediction model for scoping success from which we can draw recommendations and warnings.

Amdocs will supply:
- Vast database with relevant parameters’ measurements over time.
- Professional consulting of scoping experts, business background and interviews.
- Office, computer and analysis tools.

Requirements: Intensive applied mathematics background in performance or statistical analysis (M.Sc., Ph.D. students or post-doc)

Full/Part time position: Either full time or part time, for 3 months at least. At least 2 days a week at Amdocs office in Raanana.

Contact Details: Gilli Shama, gillis@amdocs.com 09-7786214