Abraham Heifets

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OBJECTIVE

To construct an army of killer robots that would enable my plans for world domination to succeed.

SKILLS

- Compiler/Interpreter Design and Implementation
- Heuristic Search , Classical Artificial Intelligence
- Statistical Machine Learning Algorithms & Techniques
- Java, XML/XSL, OCaml, Python, Perl, C/C++, Bash

EDUCATION

University of Toronto   *Toronto, Ontario*
Candidate for Doctor of Philosophy in Computer Science   matriculated January 2008

Cornell University, College of Engineering   *Ithaca, New York*
Master of Engineering in Computer Science   January 2003
- Project: Rapid Search of Approximate Cartesian Graphs

Cornell University, College of Engineering   *Ithaca, New York*
Bachelor of Science in Computer Science   May 2001

Selected Coursework

<u>AI</u>	Advanced Artificial Intelligence • Game Theory • Machine Learning & Data Mining • Computational Linguistics • Applied Logic
<u>Algorithms</u>	Analysis of Algorithms • Structure of Information Networks • Probability and Random Signals
<u>Systems</u>	Advanced Operating Systems • Compiler Design • Parallel Computer Architecture

WORK EXPERIENCE

IBM, T.J. Watson Research Center   *Cambridge, Massachusetts*
Staff Software Engineer   December 2003 – November 2007
Contractor through Techlink Systems, Inc.   June 2003 – December 2003
- Technical lead to design and implement streaming XSL compilation, enabling transformation of immense documents
- Applied memory-efficient XSL compilation to major e-business system, handling tens of millions of transforms/day
- XSL team project named IBM Research Accomplishment, awarded for contributing more than $10 million revenue
- Developed validating XML parsers which run up to 15x faster than industry-standard parsers
- Implemented new data access model and demonstrated a 4.3x speed-up over customer's existing XSLT solution
- Built an XSL interpreter to mitigate long compilation times and aid compiler debugging
- Built an automated testing system to pinpoint regressions in conformance and performance

Cornell University, Algorithms Research   *Ithaca, New York*
Research Assistant   June 2002 – May 2003
- Developed novel algorithm to exponentially speed up A* searches via task decomposition
- Implemented and optimized algorithm for empirical validation in preparation for publication

IBM, T.J. Watson Research Center   *Hawthorne, New York*
Research Assistant   May 2001 – December 2001
- Developed reliable methods to monitor distributed transactional system configuration and behavior during heavy load
- Refined methods to modify and instrument arbitrary Java programs through byte-code manipulation
- Implemented a lightweight distributed event logging utility that was used to solve customer's critical situations
- Explored migration options for a complex real-world business application into laboratory environment for analysis

IBM, Almaden Research Center   *San Jose, California*
Extreme Blue West Participant   June 2000 – August 2000
- One of 18 computer science students to participate in IBM's most exclusive summer internship program
- In a team of four interns, designed, developed, and implemented an application prototype to deliver location based services to wireless devices employing location awareness technology
- Proposed a business plan for the product to top IBM executives, including CEO Louis Gerstner

Cornell University, Integrated Systems Research   *Ithaca, New York*
Robocup AI Team Lead   August 1999 – June 2000
- Head of Artificial Intelligence for championship-winning Robotic World Cup Soccer team
- Implemented a robust, real-time, networked, multi-agent decision and strategy system

TEACHING EXPERIENCE

University of Toronto   *Toronto, Ontario*
Teaching Assistant   January 2008 – April 2008
- TA for CSC488: "Compilers and Interpreters"

Cornell University   *Ithaca, New York*
Teaching Assistant   August 2002 – December 2002
- Masters TA for CS172: "Computation, Information, and Intelligence"

HONORS AND AWARDS

- Helen Sawyer Hogg Graduate Admission Award.
- IBM Research Division Award for Xylem language and compiler for XSLT processing and e-business applications.
- IBM Invention Achievement Awards, First and Second Plateau.
- Cornell Computer Science Outstanding TA award.
- Time Magazine's Person of the Year 2006.

PUBLICATIONS

- Matsa, M., Perkins, E., Heifets, A., Kostoulas M. G., Silva, D., Mendelsohn, N., Leger, M. **A High-Performance Interpretive Approach to Schema-Directed Parsing**. Proceedings of the 16th International Conference on World Wide Web (Banff, Canada, May 8 - 12, 2007). WWW '07. ACM Press, New York, NY, 1093-1102. **Presented at WWW2007**.

- Kostoulas, M. G., Matsa, M., Mendelsohn, N., Perkins, E., Heifets, A., and Mercaldi, M. **XML Screamer: an integrated approach to high performance XML parsing, validation and deserialization**. Proceedings of the 15th International Conference on World Wide Web (Edinburgh, Scotland, May 23 - 26, 2006). WWW '06. ACM Press, New York, NY, 93-102. **Nominated for Best Paper Award**.

- Perkins, E., Matsa, M., Kostoulas, M. G., Heifets, A., and Mendelsohn, N. 2006. **Generation of efficient parsers through direct compilation of XML Schema grammars**. IBM Systems Journal 45(2):225-245. 2006.

- Perkins, E., Kostoulas, M. G., Heifets, A., Matsa, M., Mendelsohn, N. **Performance Analysis of XML APIs**. Proceedings of the XML 2005 Conference and Exposition (November 14-18, 2005). XML2005.

PATENTS

- Babu, A., Heifets, A., Krauszer, A., Paterson, R., White Eagle, B., **System and method for aggregating information to determine users' locations**. US Patent 7,139,252. Granted November 21, 2006.

- Babu, A., Heifets, A., Krauszer, A., Paterson, R., White Eagle, B., **System and method for handling location information.** US Patent Application 20020143930. Filed October 3, 2002.

- Quan, D., Perkins, E., Murthy, C., Heifets, A., Kesselman, J., Matsa, M., **Methods and apparatus for views of input specialized references**. US Patent Application 20080034010. Filed August 7, 2006.

- Heifets, A., Kostoulas, M., Matsa, M., Perkins, E., **High-level Virtual Machine for Fast XML Parsing and Validation.** US Patent Application 20080104592. Filed June 5, 2007.

- Heifets, A., Kostoulas, M., Matsa, M., Perkins, E., **Schema Specific Parser Generation.** US Patent Application 20080104105. Filed June 5, 2007.

- Heifets, A., Kostoulas, M., Matsa, M., Perkins, E., **Orthogonal Integration of De-serialization into an Interpretive Validating XML Parser.** US Patent Application 20080104095. Filed June 5, 2007.