Arnold Binas

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Education

Fall 2007 to present

Ph.D. in Computer Science, University of Toronto, Toronto, Ontario
GPA 4.00
Courses in Machine Learning, Computer Vision, Object Recognition, IT Consulting
Member of the Machine Learning research group in Artificial Intelligence under the supervision of Richard Zemel

Fall 2005 to Spring 2007

M.Sc. in Computer Science, University of Toronto, Toronto, Ontario
January 2007. GPA 3.86
Courses in Machine Learning, Probabilistic Graphical Models, Knowledge Representation and Reasoning, IT Entrepreneurship
Member of the Knowledge Representation and Reasoning research group in Artificial Intelligence under the supervision of Sheila McIlraith

Fall 2001 to Fall 2004

B.Sc. in Computer Science, Texas A&M University, College Station, Texas
December 2004. Overall GPA 3.94, Computer Science GPA 4.00
Graduate-level course in Multi-Agent Systems
Honors courses in Mathematics and Computer Science
Minor in Mathematics

Software Development Experience

Summer 2009

Software Engineering Intern, Google Inc., Mountain View, CA

- Member of the Image Search team (Machine Learning & Computer Vision)
- Developed, implemented, and investigated Machine Learning methods for image ranking for similar-images.googlelabs.com
- Wrote code in C++ to do learning, evaluation, and massively distributed data processing

Summer 2004

Software Design Engineer Intern, Microsoft Corporation, Redmond, WA

- Member of Assistance Platform Analysis Group
- Designed user interface components and back-end data management features to improve usability and integration of data analysis tool
- Implemented features in C# for the .NET framework
- Gained experience with large-scale agile software development in a group of seven developers plus associated testers as part of an over 100-person effort

Summer 2002 to Summer 2003

Student Employee, Dept. of Computer Science, Texas A&M University, C. S., TX

- State-funded software development team project
- Created tools to automate and accelerate the generation of interactive e-learning modules using Macromedia Authorware
- Developed modules covering topics related to object-oriented programming in Java

Research Experience

Fall 2007 to present

Research Assistant, Dept. of Computer Science, University of Toronto, Toronto, ON

- Research with Dr. Richard Zemel in Machine Learning
- Investigating and developing supervised embedding/distance metric learning methods to facilitate a novel kind of transfer learning
- Implementing and testing methods on unsupervised unfamiliar face recognition and image tagging tasks

Fall 2005 to Spring 2007
Research Assistant, Dept. of Computer Science, University of Toronto, Toronto, ON
- Research with Dr. Sheila McIlraith in Knowledge Representation and Reasoning
- Developed a theoretical framework for inconsistency-tolerant distributed logical reasoning in a peer-to-peer setting motivated by the Semantic Web
- Constructed distributed query-answering algorithms and proved their correctness
- Implemented and empirically tested the algorithms and optimizations

Fall 2003 to Fall 2004
Undergrad Researcher, Dept. of Computer Science, Texas A&M U., C. S., TX
- Research with Drs. Thomas Ioerger (CS) and John Valasek (Aerospace Engineering)
- Simulated automated air traffic control using a hierarchical task language for multi-agent systems as well as Prolog
- Implemented components of a distributed aircraft simulation system in Java, C++
- Investigated a practical approach to belief reasoning for software agents to reason about their own as well as other agents' beliefs

Summer 2003
Vacation Research Scholar, National ICT Australia (NICTA), Canberra, Australia
- Research with Dr. John Slaney, Australian National University
- Implemented a combination of an existing first-order logic theorem prover and an existing model generator in C to form a semantically guided theorem prover
- Investigated, tuned, and documented the behavior of the resulting new system

Related Project Work

Spring 2009
Dept. of Computer Science, U. of Toronto, and Chapters/Indigo, Toronto, ON
- CSC 2125—Topics in Software Engineering: Software Development Tools & Practices course project: Consulting for Chapters/Indigo's community website
- Identifying, implementing, and investigating objectives and statistical or machine learning algorithms for the automated suggestion of potential friend matches in a book-centered social networking environment

Spring 2008
Dept. of Computer Science, University of Toronto, Toronto, ON
- CSC 2535—Advanced Machine Learning course project: *Towards Improving the Generalization Performance of Boosted NCA in Sparse Datasets*
- Identified a potential problem with the neighborhood component analysis algorithm in high-dimensional sparse datasets
- Suggested, implemented, and investigated two approaches to alleviate the problem: a new objective function and a regularization term

Spring 2008
Dept. of Computer Science, University of Toronto, Toronto, ON
- CSC 2523—Object Modeling and Recognition course project: *Learning Representations of Object Instances: An Application to Recognizing Unfamiliar Faces*
- Trained a neural network on error-correcting output codes to learn higher-order features for use in unfamiliar face recognition by boosting
- Learned features had intuitive interpretation and resulted in performance gain

Fall 2005
Dept. of Computer Science, University of Toronto, Toronto, ON
- CSC 2515—Machine Learning course project: *Markovian Time Series Models for Language Identification*
- Regularized and implemented regular, aggregated, and hidden Markov document classification models for language identification in text
- Designed and executed tests to investigate the degree of similarity of six Roman script-based languages using these models

Teaching Experience

Fall 2005 to Fall 2008

Teaching Assistant, Dept. of Computer Science, U. of Toronto, Toronto, ON

- CSC 104—The How and Why of Computing, for liberal arts undergraduates
- Led tutorials and lab Q&A sessions, graded assignments and tests
- Five semesters with four different instructors and teaching styles

Skills

- Programming languages: C/C++, Java, Matlab; familiar with Python, C# .NET, Pascal, Prolog, Jess, and Web programming (HTML, CSS, CGI, JavaScript, AJAX, ActionScript)
- Software: Linux/Unix, MS Visual Studio .NET, Borland JBuilder, LaTeX, CVS, Perforce, Adobe Photoshop and Premiere
- Fluent in German, English, and basic Indonesian; familiar with Russian; one semester of Vietnamese

Honors and Achievements

- AAAI Scholarship to attend the Nineteenth National Conference on Artificial Intelligence 2004, San Jose, California, as an undergrad
- Scholarship to attend the Richard Tapia Celebration of Diversity in Computing Conference 2003, Atlanta, Georgia
- Dean's Honor Award each semester 2001–2004, J.W. Van Dyke Memorial Scholarship 2002–2003, Jeffrey John Becker '82 Scholarship 2002–2003, Former Student Association Scholarship 2003–2004, TAMU Academic Incentive Award 2003–2004, TAMU Academic Achievement Award 2004–2005
- Academic recognition by the German Physics Society (DPG) after high school

Publications

Arnold Binas and Sheila A. McIlraith (2008), **Peer-to-Peer Query Answering with Inconsistent Knowledge**, *Proceedings of the 11th International Conference on Principles of Knowledge Representation and Reasoning* (Sydney, Australia).

Arnold Binas and Sheila A. McIlraith (2007), **Exploiting Preferences over Information Sources to Efficiently Resolve Inconsistencies in Peer-to-peer Query Answering**, *Proceedings of the 2007 AAAI Workshop on Preference Handling for Artificial Intelligence,* pages 15–22 (Vancouver, Canada).

Arnold Binas (2007), **Distributed Query Answering in Peer-to-peer Reasoning Systems**, M.Sc. thesis, Department of Computer Science, University of Toronto.

Arnold Binas and John K. Slaney (2004), **Semantically Guiding a First-Order Theorem Prover with a Soft Model**, *Proceedings of the Nineteenth National Conference on Artificial Intelligence*, pages 948–949 (San Jose, California).

John K. Slaney, Arnold Binas, and David Price (2004), **Guiding a Theorem Prover with Soft Constraints**, *Proceedings of the European Conference on Artificial Intelligence*, pages 221–225 (Valencia, Spain).

The system of the two publications above (called SOS) participated in the CADE ATP System Competition as part of *The 2nd International Joint Conference on Automated Reasoning* (Cork, Ireland). http://www.cs.miami.edu/~tptp/CASC/J2/Entrants.html.

Hobbies

- Travel, hiking, camping, photography
- Amateur astronomy
- Sports: basketball, volleyball, table tennis, soccer