Byron Knoll

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Education

University of British Columbia Vancouver, BC, Canada
M.Sc. Computer Science, 2009 to present

University of British Columbia Vancouver, BC, Canada
B.Sc. Double Major: Computer Science and Cognitive Systems (Cognition and Brain Stream), 2004 to 2009

Selected Coursework:

Computer Science Software Engineering · Object-Oriented Programming · Models of Computation · Functional and Logic Programming · Computer Hardware and Operating Systems · Algorithm Design and Analysis · Artificial Intelligence · Machine Learning and Data Mining · Scientific Computing · Relational Databases · Bioinformatics · Convex Optimization · Computational Linguistics · Computer Vision

Mathematics Calculus · Matrix Algebra · Linear Programming · Probability · Statistics

Philosophy Logic and Critical Thinking · Symbolic Logic · Computability, Decidability, and Recursion Theory · Decision and Game Theory · Perception · Philosophy of Mind

Electrical and Computer Engineering Digital Logic Design · Microcomputers

Psychology Biological and Cognitive Psychology · Developmental, Social, Personality, and Clinical Psychology · Cognitive Neuroscience · Neurobiological Bases of Behaviour · Principles of Animal Learning · Principles of Animal Behaviour

Professional Experience

Google (May 2010 to August 2010)
Software Engineer in Test Intern

- Performed data mining on test/compilation data to extract useful metrics.
- 20% project: implemented a Gmail Labs feature.

UBC Computer Science (September 2009 to December 2009)
Teaching Assistant

- Graduate teaching assistant for Computer Science 322 (Artificial Intelligence).

UBC Michael Smith Laboratories (May 2009 to August 2009)
Junior Bioinformatician

- Designed and implemented a database system for storing the relationships between laboratories, activities, experiments, and samples.
- Compared different tools and algorithms for expressed sequence tag assembly. Designed a new algorithm to cluster large amounts of data and perform sequence assembly in parallel. Applied the algorithm to assemble the mountain pine beetle genome and sandalwood genome.

UBC Computer Science (September 2008 to December 2008)
Teaching Assistant

- Undergraduate teaching assistant for Computer Science 121 (Models of Computation).

Microsoft (May 2008 to August 2008)
Software Development Engineer Intern

- Summer internship as a software developer for Office Live Workspace (http://workspace.office.live.com).
- Worked on two product features. One of the features (user profile page) was successfully launched during the internship and is live on the website.

UBC Computer Science (May 2007 to April 2008, January 2010 to April 2010)
Research Assistant

- Software developer for AIspace under supervision of Alan Mackworth and David Poole. AIspace is a collection of Java applets used to teach fundamental artificial intelligence concepts.
- Designed the AIspace website (http://aispace.org).

UBC Psychology (September 2006 to May 2007)
Lab Assistant

- Provided technical support for equipment and computers in the lab.
- Designed the official lab website (http://www.psych.ubc.ca/~cjlab).
- Helped design a survey website to collect data for a study.
- Performed video editing.

Competitions

- Advanced to semi-finals in Marathon category of TopCoder Open 2010.
- Advanced to semi-finals in Game Design category of ImagineCup 2010.
- Member of "Thunderbots" RoboCup team. Team leader for the artificial intelligence module. Competed in the RoboCup 2009 small size league competition in Austria and 2010 competition in Singapore.
- Member of "UBC*" programming team. Placed 5^{th} at the 2008 ACM International Collegiate Pacific Northwest Programming Contest and 15^{th} place at the 2009 contest.
- Member of "KeepItSimple" BattleCode team. Competed in BattleCode 2009, placing 10^{th} place (and 2^{nd} place in the "non-MIT" category).
- Competed in the Robotics and Algorithm category of ImagineCup 2009. Advanced to the world finals in Egypt and placed 2^{nd} (winning a $4000 prize).
- Competed in the IJCAI-09 AI Video Competition. Nominated for "best short" award.
- Competed in the Netflix Prize competition.
- Competed in several TopCoder/Google Code Jam/Al Zimmermann programming contests (2007-present).

Publications

- Knoll, B., Kisyński, J., Carenini, G., Conati, C., Mackworth, A., Poole, D. 2008. AIspace: Interactive Tools for Learning Artificial Intelligence. In Proceedings of the AAAI 2008 AI Education Workshop.

Academic Honors and Awards

University of British Columbia

- Dean's Honor List (2004-2009)
- NSERC Undergraduate Summer Research Award (summer 2007)
- Trek Excellence Scholarship for Continuing Students (2006)
- Science Scholar (2006)
- Member of Golden Key International Honor Society (since 2006)

High School

- Excellence award in Computer Science (12^{th} grade)
- National Honour Society (11^{th} and 12^{th} grades)
- Three Certificates of Excellence for volunteer social work (11^{th} and 12^{th} grades)
- Two Tahr Pin hiking awards (10^{th} and 12^{th} grades)
- Excellence award in Computers (9^{th} grade)
- Excellence award in Mathematics (9^{th} grade)

Skills

- Specialized in machine learning, artificial intelligence, and algorithm design
- Proficiency in software development (in decreasing order of familiarity) using: Java, MATLAB, R, Perl, C#, C, JavaScript, Prolog, C++, Python, Haskell, Assembly, Whitespace, Pascal, and QBasic
- Familiarity with HTML, CSS, AJAX, SQL, PHP, LaTeX, and JUnit
- Familiarity with UNIX, GNU/Linux, and Win32

Activities

- Attended ACM ICPC World Final as a guest (China, 2010)
- Attended Neural Information Processing Systems conference (Vancouver, 2009)
- Presented poster and demonstration about AIspace at AAAI conference (Chicago, 2008)
- Presented poster about AIspace at e-Learning Open House (Vancouver, 2008)
- Attended Visual Analytics conference (Vancouver, 2008)
- Volunteered at Uncertainty in Artificial Intelligence conference (Vancouver, 2007)
- Attended Robotics for Society conference (Vancouver, 2007)
- Yearbook committee/social committee (India, 2003/2004)
- Assisted design of website for Kodaikanal International School (India, 2003)
- Volunteered social service work, 90+ hours (India, 2002-2004)

Program Name	**Team Size**	**Programming Language**	**Description**
Amnesia	4	Prolog	Text adventure game.
Arlisy	1	C++	Neural network program. (http://www.sourceforge.net/projects/arlisy)
Cryptomni	1	Java	File encryption program using the one time pad cipher. (http://www.sourceforge.net/projects/cryptomni)
EternityII	1	Java	A solver for the Eternity II puzzle using stochastic local search.
Fractal	1	Java	The Mandelbrot set. (http://byronknoll.com/fractal.html)
Jabberchat	4	Java	Google Talk plugin for Eclipse.
Keyboard	2	Java	Keyboard layout optimization program using stochastic local search.
Marvin	4	Haskell	Chatterbot using natural language processing.
Mona	1	Java	Performs vectorization using stochastic local search.
Netflix Prize	1	Java	Predicting user movie ratings using a neural network.
Nort	1	Java	Two player game based on Tron. (http://byronknoll.com/nort.html)
Music Library	1	Java	MP3 organizing software.
Olymipicmaster	4	Java	Ticket manager using a SQL database.
Padomni	1	Java	Simple text editor.
Path Finder	3	C#	A maze solver for tablet PCs (using A* search algorithm).
Pattern Recognition	1	Java	Uses neural networks to predict temporal patterns. (http://byronknoll.com/pattern.html)
PCA	1	Python	Performs principal component analysis on a series of images using singular value decomposition (SVD) and projects them to a 2D display.
Ping	1	Java	A simple game based on the classic game Pong. (http://byronknoll.com/ping.html)
siarco	1	Java	Arithmetic coding. (http://code.google.com/p/siarco)
Search Engine	1	Python	Latent semantic indexing using SVD.
Soku	1	Java	Simple game involving dodging soccer balls. (http://byronknoll.com/soku.html)
Solar Hamster	4	C#	Silverlight game made for ImagineCup 2010.
RPS	1	Java	Rock, Paper, Scissors AI made using hierarchical temporal memory. (http://byronknoll.com/ping.html)
Recognizer	1	C#	Handwritten digit recognition using backpropagation neural networks (achieves over 90% accuracy).
Swarm	1	Java	A game which involves controlling a swarm of dots. (http://byronknoll.com/swarm.html)
Tagger	1	Java	Performs part-of-speech tagging using hidden Markov models (achieves approximately 80% accuracy).
Thunderbots	3	C++	Designed and implemented the AI responsible for controlling a team of five robots for the RoboCup soccer competition. Created a graphical simulator to test the AI.
Time Stop	1	C++	Time Stop is a 2D physics-based puzzle game. It uses the Box2D physics engine and OpenGL. (http://sourceforge.net/projects/time-stop)