

## Albert Goldfain

201 Bell Hall  
Department of Computer Science and Engineering  
State University of New York at Buffalo,  
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### EDUCATION

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- State University of New York at Buffalo*  
**Ph.D. Computer Science and Engineering** 2008  
Dissertation: "A Computational Theory of Early Mathematical Cognition"  
Director: Dr. William J. Rapaport  
Cognitive Science Track
- State University of New York at Buffalo*  
**M.S. Computer Science and Engineering** 2004  
Masters Project: "Using Gaze Estimation as a Meaningful Input to a Homing Task"  
Director: Dr. Peter Scott
- State University of New York at Geneseo*  
**B.A. Computer Science, B.A. Mathematics** 2001  
Graduated magna cum laude

### TEACHING EXPERIENCE

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- State University of New York at Buffalo*  
**Lecturer/Teaching Assistant** – CSE191 Introduction to Discrete Structures **Fa2007**  
Lecturer for six weeks while professor on maternity leave. Organized syllabus, project, and homework assignments; held TA meetings. Finished course as TA holding two recitations, grading, office hours, substitute teaching in lecture, and holding comprehensive exam review sessions.
- Teaching Assistant** – CSE584 Philosophy of Computer Science **Sp2006**  
Two recitations, office hours, grading written essays, supervising peer-editing sessions, organizing and moderating a debate.
- Teaching Assistant** – CSE191 Introduction to Discrete Structures **Sp2003, Fa2004, Fa2005, Sp2006, Fa2006**  
Two to four recitations, office hours, review sessions, grading, substitute teaching in lecture. Held comprehensive exam review sessions.
- Teaching Assistant** – CSE563 Knowledge Representation and Reasoning **Sp2005**  
Two recitations, grading (homework, quizzes, and exams), office hours, substitute teaching in lecture.
- Teaching Assistant** – CSE668 Animate Vision Principles **Sp2004**  
Developing project ideas for the students, finding interesting and relevant readings, substitute teaching in lecture.
- Teaching Assistant** – CSE111 Great Ideas in Computer Science **Fa2002, Fa2003**  
Interactive lab sessions, office hours, grading (homework, quizzes, exams, and program demonstrations)

## RELATED EXPERIENCE

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*Blue Highway, LLC*

**Research Contractor**

**2008-Present**

- Preliminary work on extending communications protocol for adaptive computation
- Preliminary work on device-side ontology
- Conducted unsupervised machine learning research on medical datasets

*Welch Allyn Inc., Medical Division, Skaneateles Falls, NY*

**Software Engineer**

**1999-2000,  
2002-2008  
(recurring  
summer position)**

- Implemented a cryptographic protocol and integrated it with an existing medical communications protocol
- Wrote a cryptography analysis report and feasibility study for a medical communications protocol
- Developed a software development kit for a spirometry device
- Developed a COM Server DLL for an EKG/cardiopulmonary device
- Created several serial communications test software applications for a blood pressure device
- Developed battery and modem life-test software for an automated test environment
- Ported a medical communications protocol from a Windows baseline to a Linux platform
- Generated software requirements and test documentation
- Ran various test protocols.

*Afshar Consulting Group*

**Lan System Administrator and Webmaster**

**2001**

- Set up ISP infrastructure for a small office park
- Served as administrator for a Linux web/ftp/print server.

## PUBLICATIONS

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- Goldfain, Albert (2007), "A Case Study in Computational Math Cognition and Embodied Arithmetic", *Proceedings of the Twenty-Ninth Meeting of the Cognitive Science Society (COGSCI2007)*: 293-298.
- Shapiro, Stuart C.; Rapaport, William J.; Kandefer, Michael W.; Johnson, Frances L.; and Goldfain, Albert (2007), "Metacognition in SNePS", *AI Magazine*. 28(1): 17-31.
- Goldfain, Albert and Kandefer, Michael (2006), "Co-Designing Agents", *Cognitive Robotics: Papers from the AAAI Workshop (CogRob2006)*: 77-82.
  - Also appearing in *Proceedings of the North East Student Colloquium on Artificial Intelligence (NESCAI06)*: 142-148.
- Goldfain, Albert (2006), "Embodied Enumeration: Appealing to Activities for Mathematical Explanation", *Cognitive Robotics: Papers from the AAAI Workshop (CogRob2006)*: 69-76.
- Goldfain, Albert (2006), "A Computational Theory of Inference for Arithmetic Explanation", *Proceedings of the Fifth Workshop on Inference in Computational Semantics (ICoS-5)*: 145-150.
- Goldfain, Albert (2004), "Using SNePS for Mathematical Cognition: A SNeRE Based Natural Language Algorithm for Computing GCD", Department of Computer Science and Engineering, University at Buffalo.

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- Goldfain, Albert (2001), "On the Arithmetic Power of Context-Free Languages", *Journal of Computing Sciences in Colleges, Proceedings of the Sixth Annual CCSC Northeastern Conference*. 16(4): 323-324.

#### POSTERS AND PRESENTATIONS

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- A Case-Study in Computational Math Cognition and Embodied Arithmetic
  - COGSCI07 8/2/07 (Nashville, TN)
- Anatomy of a Commonsense Mathematical Explanation
  - SNePS Research Group 2/23/07 (Buffalo, NY)
  - CSE Graduate Conference 4/13/07 (Buffalo, NY)
- Reasoning about Effect-Equivalent Acts
  - Cognitive Science Colloquium 11/8/06 (Buffalo, NY)
  - SNePS Research Group 11/14/06 (Buffalo, NY)
- Representing Quantities for Embodied Arithmetic
  - SNePS Research Group 9/26/06 (Buffalo, NY)
- Embodied Enumeration
  - AAAI/CogRob2006 7/16/06 (Boston, MA)
- A Computational Theory of Inference for Arithmetic Explanation
  - ICos-5 4/21/06 (Buxton, England).
- Applications of Ordinal Assignment Numeracy for Computational Agents
  - Cognitive Science Colloquia 2/22/06 (Buffalo, NY)
  - 2006 CSE Graduate Conference (Buffalo, NY)
- Co-Designing Agents (with Michael Kandefer)
  - SNePS Research Group 2/10/06 (Buffalo, NY)
- Question-Answering in a Mathematical Context
  - SNePS Research Group 10/25/05 (Buffalo, NY)
- Numerate Cassie
  - SNePS Research Group 9/19/05 (Buffalo, NY)
- Counting and Arithmetic in SNePS
  - SNePS Research Group 3/7/05 (Buffalo, NY).
- Towards a Computational Framework for Mathematical Understanding
  - SNePS Research Group 11/1/04 (Buffalo, NY).
- Using SNePS for Mathematical Cognition
  - SNePS Research Group 4/2/04 (Buffalo, NY).
- On the Arithmetic Power of Context-Free Languages
  - CCSCNE (Middlebury, VT).
- Irregularity of Languages with Symbol "Dependence"
  - Geneseo Undergraduate Science and Mathematics Symposium 2000 (Geneseo, NY).

#### AWARDS AND PATENTS

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- Graduate Student Excellence in Teaching Award (Honorable Mention) 2007.

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- CogSci2007 Robert J. Glushko and Pamela Samuelson Foundation Student Travel Award 2007, \$279.
  - GSEU Professional Development Award 2007, \$487.75.
  - Patent 281-455 PCT "Communications of Information Between a Plurality of Network Elements" 2006 (Welch Allyn)

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#### PROFESSIONAL MEMBERSHIPS

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- Association for the Advancement of Artificial Intelligence (AAAI)
- Cognitive Science Society (COGSCI)
- Special Interest Group in Semantics (SIGSEM)
- National Mathematics Honors Society (Pi Mu Epsilon)
- (SUNY Buffalo) Center for Cognitive Science
- (SUNY Buffalo) CSE Graduate Student Association

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#### SERVICE

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- CSE Graduate Student Association Secretary 2007.
- CSE Graduate Student Association Senator 2006-2007.
- CSE Graduate Conference Organization Committee 2006-2007.
- COGSCI 2008 National Conference Reviewer

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#### RESEARCH INTERESTS

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- Artificial Intelligence
- Knowledge Representation and Reasoning
- Mathematical Cognition
- Cognitive Agent Architectures
- Logic
- Cognitive Semantics
- Philosophy of Computer Science

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#### PROGRAMMING LANGUAGES

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- Strong Proficiency: C, C++, Java, Lisp, Perl, HTML, XML
- Working Knowledge: C#, Python, SQL.