

# Amir Aavani

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Computing Science Department,  
Simon Fraser University  
Burnaby, BC, Canada

## PERSONAL INFORMATION

Amir Aavani, June, 1982

## EDUCATION

PhD., Computing Science Department, :2008-Spring - Now  
Adviser: Dr. Eugenia Ternovska  
Simon Fraser University

M.Sc., Mathematical Science Department, Computer Science Group (Computation Theory), 2004- 2006 ; GPA: 17.60/20.00  
Thesis Title: "Information Theoretic Text Classification", accepted with score (19/20).  
Adviser: Dr. Amin Farjudian  
Sharif University of Technology

B.Sc., Computer Engineering Department, 2000- 2004; GPA: 17.16/20  
Thesis Title: "A New Compression Method for Re-Compressing Files", accepted with score (20/20).  
Adviser: Dr. Mohsen Sharifi  
Iran University of Science & Technology

## FIELD OF INTEREST

"Complexity Theory" and "Computation Theory", specially "NP-Complete Problems" and "Randomized Algorithm"  
"Algorithm Design and Analysis"  
"Computational Logic" and "Automated Theorem Proving"  
Combinatorics, Graph Theory and other Theoretical aspect of Computer Science  
Artificial Intelligence and Machine Learning

## TEACHING EXPERIENCES

2011-Summer, Teaching Assistant. CMPT 120, Computing Science Department, Simon Fraser University, Burnaby, Canada.  
2010-Fall, Teaching Assistant. MACM 101, Computing Science Department, Simon Fraser University, Burnaby, Canada.  
2008-Spring, Teaching Assistant. Data Structure and Algorithm, Computing Science Department, Simon Fraser University, Burnaby, Canada.  
2007-Fall, Lecturer. Artificial Intelligence, Department of Mathematics and Computer Science , Sharif University of Technology, Tehran, Iran.  
2007-Fall, Lecturer. Computer Programming (C and C++), Department of Mathematics and Computer Science , Sharif University of Technology, Tehran, Iran.  
2007-Spring, Lecturer. Advanced Computer Programming (C++), Department of Mathematics and Computer Science , Sharif University of Technology, Tehran, Iran.  
2006-Fall, Lecturer. Computer Programming (JAVA), Department of Mathematics and

Computer Science , Sharif University of Technology, Tehran, Iran.

2005-Spring- Now, Lecturer. Algorithm Design and ACM programming sessions, extra programs, Computer Engineering Department, Iran University of Science and Technology, Tehran, Iran.

2003-Fall & Spring, Teaching Assistant. Information Storage and Retrieval, Computer Engineering Department, Iran University of Science and Technology, Tehran, Iran.

2002-Fall, Teaching Assistant, Data Structure and Algorithm Design, Computer Engineering Department, Iran University of Science and Technology, Tehran, Iran.

1999-Fall, Teaching in High school, Combinatorics, Shahid Beheshti High school, Babel, Iran.

#### AWARDS AND HONORS

- President's PhD Research Stipend award, 2012 (Canada)
- Faculty of Applied Sciences Graduate Scholarship award, 2012 (Canada)
- Faculty of Applied Sciences Graduate Scholarship award, 2011 (Canada)
- Faculty of Applied Sciences Graduate Scholarship award, 2010 (Canada)
- Ten thousand dollars award in the form of MITACS internship, Vancouver 2008 (Canada)
- 1st place award in Server Development field of Robocup 2005 (Japan).
- 4th place in ACM ICPC regional contest, Tehran 2004 (Iran).
- Ranked 10th out of about 5000 students in Higher Education (M.Sc) examination 2004 (Iran).
- Graduate as the first student in Computer Engineering Department of Iran University of Science & Technology 2004 (Iran).
- 2nd place award in Visualization competition of Robocup, 2003 Padova (Italy).
- 3rd place award in Coach competition of Robocup, Padova 2003 (Italy).
- 6th place in ACM ICPC regional contest, Tehran 2004.
- 1st place in Coach contest of American Open- 2003.
- 4th place in ACM ICPC regional contest, Tehran 2003.
- 9th place in ACM ICPC regional contest, Tehran 2002.
- Silver Medal, 9th Iran National Olympiad in Informatics, Iran, 1999.

#### LANGUAGES

- Persian: Fluent, Native
- English: Fluent

#### SPECIAL SKILLS

- Expert knowledge of the Linux operating system.
- Expert knowledge of programming languages: Pascal, Object-Pascal, C/C++, Java, PHP.
- Knowledge of the professional typesetting package  $\text{\LaTeX}$ .
- Strong writing, grammar, and linguistic skills.
- Strong graphic-design skills useful in presentations, publications, and schematics.
- Some Knowledge of .Net and ASP Programming Languages

## PUBLICATIONS

A. Aavani, "A Family of Encodings to translate Pseudo-Boolean Constraints into CNF", Submitted to *Fifteenth International Conference on Theory and Applications of Satisfiability Testing*, 2012.

A. Aavani, N. Wu, E. Ternovska, D. Mitchell, "Enfragmo: A System for Modelling and Solving Search Problems with Logic", *The 18th International Conference on Logic for Programming Artificial Intelligence and Reasoning*, 2012.

A. Aavani, "Translating Pseudo-Boolean Constraints into CNF", *Fourteenth International Conference on Theory and Applications of Satisfiability Testing*, 2011.

A. Aavani, N. Wu, E. Ternovska, D. Mitchell, "Grounding Formulas with Complex Terms", *Canadian Conference on Artificial Intelligence*, 2011.

A. Aavani, N. Wu, E. Ternovska, D. Mitchell, "Grounding Formulas with Complex Terms", *3rd International Workshop on Logic and Search*, 2010.

A. Aavani, N. Wu, E. Ternovska, "Grounding Count Constraints", *Accepted as a short paper in 16th International Conference on Logic for Programming Artificial Intelligence and Reasoning*, 2009.

A. Aavani, S. Tasharrofi, G. Unel, E. Ternovska, D. Mitchell "Speed-up Techniques for Negation in Grounding", *16th International Conference on Logic for Programming Artificial Intelligence and Reasoning*, 2009.

M. Sharifi, A. Aavani S. Tasharrofi, "Using XCS as a Predictor Engine in Compression", *International Conference on Intelligent Systems and Knowledge Engineering* , 2007.

A. Aavani, A. Farjudian, M. Salmani, "Information Theoretic Text Classification", *12th Computer Society of Iran Computer Conference*, 2007.

A. Aavani, R. Hesamifard, S. Bagheri, S. Remezani, V. Hashemi, "Pardis, a Fuzzy Extension to Multiagent Simulation Systems", *Fourteenth Iranian Computer Engineering Conference*, 2006.

M. Salmani, A. Aavani, "Reducing Scan Base Testing Power by Using Genetic Algorithm", *Fourteenth Iranian Computer Engineering Conference*, 2006.

K. Mizanian, M. Salmani, A. Aavani, M. Analoui, "A New Adaptive HTTP Protocol", *Canadian Conference on Electrical and Computer Engineering*, 2006.

J. Sadeghi, A. Aavani, and M. Sharifi, "CyberSession: A New Proposition for E-Learning in Collaborative Virtual Environments", *International Conferences in Central Europe on Computer Graphics, Visualization and Computer Vision*, 2005.

S. Parsa, S. Lotfi, O. Boushehrian, A. Aavani, S. Tasharrofi, "A New Method for Loop Parallelization Using Genetic Algorithms", *Ninth Iranian Computer Engineering Conference*, 2004.

M. Sharifi, H. Mousavian, A. Aavani, "Predicting the Future State of the Robocup

Simulation Environment: Heuristic and Neural Networks”, *IEEE Man and Cybernetics*, 2003.

*Graduate Courses* Analytic Combinatorics, Cryptography, Theory of Computer Science, Neural Network, Computational Complexity, Advanced Mathematical Software, Advanced Computation Theory, Computational Logic

*Work Experience* D-Wave Systems, as an internship, Burnaby, BC, Canada Sept. 2008 - Present (Internship) Researcher (Extending MX with aggregates)

Sepanta Robotic Research Foundation., Tehran, Iran 2006 - 2008 (Full time)  
Researcher, Project Manager

Sepanta Robotic Research Foundation., Tehran, Iran 2003 - 2006 (Part time)  
Researcher, Project Manager

Armitis Software Co., Tehran, Iran 2001-2003 (Part time)  
Programmer, Web Programmer, Project Manager

*Projects that I was involved in*

*MX-Project:* As a part of my PhD research, I am working on adding the support for aggregates to the grounder. This part of the project is mainly theoretical and I am going to propose algorithms which ground the input formula to different solving technology such as SAT and ILP. Also, as a member of the project, I have programming task mostly related to implementing my ideas to improve the performance and design of the code.

*PSP: Pascal Server Page:* I am one of developers in PSP-group which is going to develop a pascal based toolkit for developing web applications. The main structure of psp is procedural and I am going to redesign and re-code the project and I am using object oriented in it. The new branch is named O-PSP and has some other features besides object oriented concepts.

*Persian Meta Search Engine:* It will soon be publicly available. Being both the project manager and one of the programmers in this project, I designed the architecture so that it uses Google, Yahoo and MSN to procure a better result for Persian queries.

**Status:** Completed, going to appear publicly

**Programming Language:** C++

**Operating System:** Fedora core 4

**Web server:** Apache

*Persian OCR:* Being currently under development, the Persian OCR consists of three groups, namely “pre-processing” (skew detection and correction, noise reduction, etc), “recognition engine” (word segmentation, character recognition, etc) and “post-processing” (spell-checking, etc). Of these groups, I am conferred the management of the recognition engine group although I have not missed an active role in programming tasks.

**Status:** Under development

**Programming Language:** C#

**Operating System:** Windows XP

*Persian ICR:* The Persian ICR (Paradise) is an application which automates the process of obtaining data from hand-written forms (e.g. registration forms) with a high accuracy (99.0%). As Persian Alphabets stick together to form a word rather than being written

separately like Latin Alphabets do, it is extremely hard to recognize the handwritten texts automatically. The Persian ICR, however, tackles the problem in other way by assuming that the input is given in the form of separate characters which is a usual case in many official forms such as bank receipts or registration forms. I played the role of the main programmer in this project. The project is now completed and being used to automate data entry process at NAJA.

**Status:** Launched

**Programming Language:** Delphi and C++Builder

**Operating System:** Windows XP

*Kaveh Server for Soccer Robocup Competition:* Developed for the “Server development competition” in Robocup 2005, this server has achieved the first rank of the competition. The server, instead of communicating the exact values with clients, sends them a series of Fuzzified values and expects them to respond in the same manner. To develop the server, I have used the source of the original robocup soccer server, in C++under Linux, and modified it such that it worked based on Fuzzy logic.

**Status:** Completed

**Programming Language:** C++

**Operating System:** Linux (Fedora core)

**Awards received:** First rank in “Server development” category at Robocup 2005.

*News crawler and organizer:* In this project, we have developed a crawler which automatically browses more than twenty news agencies and makes a record of them together with their meta-data (such as publish date, category, etc) in a database. Besides, a mechanism was implemented to retrieve the related news. The application piloted for a three-month period and although showing a good performance, was suspended due to lack of sponsorship. The problem is at the moment being looked to by the other team member.

**Status:** Completed, waiting for funds to be launched

**Programming Language:** C++for crawler and PHP for web-application

**Operating System:** Linux (Fedora core)

*PersaProject:* In this project, we have tried to implement a web application in which there are two kinds of users: namely, customers and programmers. Customers can order a project or application and the programmers can offer them a price to get the job. The project is complete but we can not find any sponsor for launching it. The application’s language in Persian and we have used XML/XSLT technology in our implementation.

**Status:** Completed, waiting for funds to be launched

**Programming Language:** PHP

**Operating System:** Linux (Fedora core)

**Database:** MySQL

*Administration of Operating System Lab.:* During my B.Sc, I was bestowed the administration of IUST OS-Lab in which a variety of operating systems such as Linux (different versions) and Windows (different versions) are included and maintained so as to be exploited by students in their OS-lab course.