

**OBJECTIVE:** Conducting research, gaining deep knowledge and increase my experience in the field of Computer Science in general and in Machine learning , Computational Biology and Algorithm Design in particular.

## ACADEMIC AND RESEARCH EXPERIENCE

### **EDUCATION:**

2008 – Present **PhD Candidate** Computer Science, University of Toronto, Canada

- *GPA:* 3.96 / 4.0
- Coursework included : Machine Learning, Numerical Software, The Business of Software, and Computational Biology

July 2003 **Master of Science** in Computer Science, The American University in Cairo (AUC), Egypt. (<http://www.aucegypt.edu/>)

- *GPA:* 3.92
- *Coursework included:* Advanced Software Engineering, Neural Networks and Genetic Algorithms, High Speed Networks, and Cluster Computing.
- *Thesis: “Connectionist Approaches to Cost-Based Abduction”.* Using High Order Recurrent Neural Networks (HORNs) to find the optimal solution, the least cost explanation, for a given Cost-Based Abduction (CBA) Instance. CBA is an important AI formalism for representing knowledge under uncertainty. Evidence to be explained is treated as a goal to be proven through a set of observed hypotheses each is associated with an assumability cost. Finding the least cost proof for a given CBA instance is an *NP-Hard* problem.
  - *Thesis Supervisor:* Dr. Ashraf M. Abdelbar (Associate Professor of Computer Science, AUC).
  - *Thesis External Examiner:* Dr. Donald C. Wunsch II (Mary Finley Missouri Distinguished Professor of Computer Engineering, University of Missouri-Rolla, USA).

June 2000 **Bachelor of Science**, The American University in Cairo (AUC), Egypt.

- *Major:* Computer science. (*Accredited By the Computer Science Accreditation Board CSAB*)
- *Minor:* Business Administration.
- *GPA:* 3.85/4.0. (Highest Honor) Graduation project grade: A.
- *Coursework included:* Independent study team project, Computer Networks and Data Communication, Object Oriented Programming Using C++, Java & Ada programming languages, Artificial Neural Networks, Compiler Design, and Human Resource Management.
- *Graduation Project:* Designing and implementing the data mining tool that can be used to implement the appropriate operations of retail/marketing data mining applications. The project followed the knowledge discovery paradigm and fully implemented using Computational Intelligence techniques (Neural Networks and Simulated Annealing).

## PUBLICATIONS

### **BOOKS:**

- Abductive Reasoning Optimization Using Recurrent Neural Networks: Theory, solution architecture and implementation techniques. Emad Andrews. VDM Verlag Dr. Miller Aktiengesellschaft & Co. KG, Saarbrücken Germany. ISBN 978-3-639-22868-7

### **JOURNAL PUBLICATIONS:**

- “Finding MAPs Using Strongly Equivalent High Order Recurrent Symmetric Connectionist Networks “ Accepted at *Journal of Cognitive Systems Research* (Elsevier) 2010
- ”Neural Networks Approaches for Discovering the Learnable Correlation between Gene Function and Gene Expression in Mouse” Emad Andrews, Quaid Morris, and Anthony j. Bonner, *Neurocomputing*, Volume 71 , No. 16-18, pp.3168-3175 (2008)
- “Recurrent Neural Networks with Backtrack-Points and Negative Reinforcement Applied to Cost-Based Abduction” M. Abdelbar, Mostafa A. El-Hemely , Emad A. M. Andrews, and Donald C. Wunsch II. *Neural Networks*, Vol. 18, No. 5-6, July 2005. pp. 755-764
- “A Connectionist Approach to Cost-Based Abduction” M. Abdelbar, Emad A. M. Andrews, and Donald C. Wunsch II. *International Journal of Computational Cognition*. Vol. 3 Number 2, June 2005. pp. 46-51
- “Abductive Reasoning with Recurrent Neural Networks” Ashraf M. Abdelbar, Emad A. M. Andrews, and Donald C. Wunsch II. *Neural Networks*, Vol. 16 Number 5-6, June-July 2003, pp. 665-673.

**CONFERENCE PUBLICATIONS:**

- "Finding MAPs Using High Order Recurrent Networks" Emad Andrews, and Anthony J. Bonner. C.S. Leung, M. Lee, and J.H. Chan (Eds.): *in the proceedings of the 16<sup>th</sup> International Conference on Neural Information Processing (ICONIP 09)*, Part I, published as a multi-volume set in Springer's LNCS series Vol. 5863, pp. 100-109, Springer-Verlag, Berlin, Heidelberg
- "Connectionist Approaches for Predicting Mouse Gene Function from Gene Expression" Emad Andrews Shenouda, Quad Morris, and Anthony J. Bonner. King et al. (Eds), *In The Proceedings of the 13<sup>th</sup> International Conference on Neural Information Processing (ICONIP 06)*, published as a multi-volume set in Springer's LNCS series Vol. 4232, pp. 280-289, Springer-Verlag, Berlin, Heidelberg
- "A Quantitative Comparison of Different MLP Activation Functions in Classifications" Emad A. M. Andrews Shenouda. J. Wang et al. (Eds), *in the proceedings of the International Symposium on Neural Network (ISNN-2006)*. published as a multi-volume set in Springer's LNCS series Vol. 3971, pp. 849-857, Springer-Verlag, Berlin, Heidelberg.
- "Negative Reinforcement and Backtrack-Points for Recurrent Neural Networks for Cost-Based Abduction" M. Abdelbar, Mostafa A. El-Hemely, Emad A. M. Andrews, and Donald C. Wunsch II. *In Proceedings of IEEE/INNS International Joint Conference on Neural Networks (IJCNN-2005)*, Vol. 2, pp. 827 - 832
- "Finding Least Cost Proofs Using High Order Recurrent Networks" Ashraf M. Abdelbar, Emad A. M. Andrews, and G. A. Tagliarini, *In Proceedings of IEEE/INNS International Joint Conference on Neural Networks (IJCNN-2003)*, Vol. 4, pp. 2803 - 2806
- "A Hybrid Annealing-Neural Approach to knowledge Discovery in Databases" Ashraf M. Abdelbar, A. Khalil, and Emad A. M. Andrews. *In Proceedings of the ISCA 3<sup>rd</sup> International Conference on Information Reuse and Integration (IRI-2001)*.

**AWARDS & HONORS:**

2004-2006	NSERC Postgraduate Scholarship (Doctoral)
2003	AUC conference grant to present a paper in <i>The (IJCNN-2003)</i> , Portland, Oregon, USA.
2001	AUC conference grant to present a paper in <i>the (IRI-2001) Conference</i> , Las Vegas, USA.
2000-2003	University fellowship for postgraduate studies at the American University in Cairo. (For 2 Years)
2000	Honor Academic Performance certificate for senior students from the American University in Cairo.
1999	Honor Academic Performance certificate for junior students from the American University in Cairo.
1995-2000	Academic Achievement scholarship for undergraduate studies at the American University in Cairo.

**ADDITIONAL COURSES ATTENDED:**

- Two years at the School of Pharmacy, Ain Shams University, Cairo, Egypt.

**PROFESSIONAL CERTIFICATES ACHIEVED:**

- Sun Certified Programmer for Java 2 Platform (April 2002).

**NEURAL NETWORKS SKILLS:**

***Fully implemented the following neural network applications in C, C++:***

- Multi Layer Perceptron (MLP) network for breast cancer diagnoses.
- The quadratic version of the Hopfield Symmetric Connectionist Neural Network for solving constraints satisfaction and optimization problems.
- The Group Method of Data Handling (GMDH) network.
- Conducted a constructive comparison among the different basic functions types as activation functions of the MLP networks for breast cancer diagnoses MLP.
- Kohonen Neural network for knowledge discovery operations of data mining applications.
- Simulated Annealing for automatic adaptation of the Kohonen Neural Network parameters.
- The High Order version of the Hopfield Symmetric Connectionist Neural Network to find the optimal solution for optimization and constraints satisfaction problems (The MSc. Thesis)

**SKILLS:**

***Programming and technologies:***

- **Programming Languages:** Pascal, Assembly, C, C++, Java, MFCs, JFCs, VDHL, Ada, Matlab, and Fortran
- **Operating Systems:** DOS, MS-Windows NT 4.0, 2K, XP, 9X, ME, Linux and Solaris.

- **Ready Made Packages:** Visio, MATLAB.
- **Cluster and Parallel Computing:** MPI and PVM.
- **Software Engineering:** UML, Booch Notation, CMM, Object Oriented, and Multithreaded Programming
- **Database Servers (RDBMS):** Oracle8i, Oracle9i, IBM-DB2, Sybase, and MS-SQL Server.
- **IBM technologies:** VisualAge for Java, WebSphere Application Server, WebSphere Commerce Suite, WebSphere Studio, WebSphere Portal and WebSphere Application Developer.
- **Web Development:** (J2EE): EJBs, Servlets and JSPs, HTML, XML, JavaScript and Interwoven TeamSite.
- **Case Tools:** Cool:Plex, Rational ClearCase and Rational Rose.
- **Application and Web Servers:** Apache Tomcat BEA Weblogic, IIS, Java Web Server, and Omni HTTP.

**Communication:**

- Excellent presentation and reporting skills.

## TEACHING EXPERIENCE

2006 - 2009: **Graduate Teaching Assistant**, Department of Computer Science, University of Toronto.

2000 - 2003: **Graduate Teaching Assistant**, Computer Science Department, the American University in Cairo (AUC).

**Working Courses:**

- Java Programming Language
- Artificial Neural Networks
- Theory of Computing
- CSC165Mathematical Expression and Reasoning
- Concept of Programming Languages
- Data Structure
- CSC263: Data Structure and Analysis

1997-1998 : **Volunteer Undergraduate Teaching Assistant**, Computer Science Department, AUC.

## INDUSTRIAL EXPERIENCE

2003 - 2004: **Senior Software Application Developer**, Tu cows Inc., Toronto Branch (<http://tu cows.ca> )

**Professional Projects Participation:**

- 1- *DNS Management.*
- 2- *Mercury Complete Suite Project.*
- 3- *Expiring Domains e-auctioning system.*

2001 - 2003: **Software Developer**, Raya Software (<http://www.rayaholding.com/> ).

**Professional Projects Participation:**

1. *National Insurance of Egypt Automation*

**Project Description:** Automating the whole documentation life cycle of the National Insurance of Egypt Company, one of the largest insurance companies in Egypt and Middle East.

**My Role:** Cool:Plex , developer and trainer.

**Tools & Technologies:**

- Cool:Plex 5.0
- Visual C++

2. *EGov Ministry of Education*

**Project Description:** Designing and building the Electronic Government project for the Egyptian Ministry of Education.

**My Role:** Team leader, designer and developer.

**Tools & Technologies:**

- Cool:Plex 5.0
- Oracle8i database.
- Visual C++.

3. *Vodafone Intranet*

**Project Description:** Designing and building Vodafone International Intranet system. The system electronically enables all possible activities throughout the whole organization while automating the entire work environment.

**My Role:** Java and web developer.

**Tools & Technologies:**

## Emad A. M. Andrews

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- Java (J2EE).
- MVC Model is adopted.
- Oracle8i database.
- HTML.
- IBM VisualAge for Java with Tom-Cat application server test environment.

### 4. IBM WebSphere Commerce Suite

**Project Description:** Researching, in depth, IBM Commerce Suite Server structure and specifications.

**My Role:** Java and web developer, Database Reverse Engineering.

**Tools & Technologies:**

- Java
- IBM DB2
- XML.
- IBM WebSphere Application Server.

### 5. Vodafone Visa System

**Project Description:** Building a generic visa appointment system (Used right now by the following embassies in Egypt: The American embassy, the German Embassy, and the French Embassy).

**My Role:** Java and web developer, Database Migration.

**Tools & Technologies:**

- Java (J2SE).
- Java (J2EE).
- Oracle8i.
- HTML.

### 6. Vodafone Website

**Project Description:** Building administration modules for Vodafone website in click premises.

**My Role:** Java and web developer

**Tools & Technologies:**

- Java (IBM-VisualAge)
- Oracle
- Ms-Source Safe
- HTML
- IBM-WebSphere Studio and IBM WebSphere Application Server.

### 7. XML Generator real time system

**Project Description:** Designing and implementing a real time XML generator system that converts syndicated database tables updated periodically into XML files.

**My Role:** Designer and Java Developer

**Tools & Technologies:**

- Java (IBM-Visual Age)
- Elementary information in XML

### 8. Flying Puzzle Applet

**Project Description:** Designing and implementing a flying puzzle applet using Java Swings. An image is cut into pieces. Each piece moves in a random separate trajectory. To solve the puzzle, the user has to reconstruct the image.

**My Role:** Software Designer and Java Developer

**Tools & Technologies:**

- Java
- HTML

2000 - 2001: Java programmer and Web developer,

Nomad International Company.

**Professional Project Participation:**

#### 1. Minhina.com Portal

**Project Description:** Building a complete portal in both Arabic and English using J2EE technology.

**My Role:** Java and web developer, database migration and building the publishing back end.

**Tools & Technologies:**

- Java (J2EE)
- Oracle8i , MS-SQL Server
- Interwoven TeamSite software
- Weblogic Application Server

## INTERNATIONAL SOCIETIES MEMBERSHIP :

2004 - 2009 **Member**, Society for Industrial and Applied Mathematics (SIAM)

2003 - 2010 **Member**, the International Neural Network Society (INNS).

2000 - 2007 **Member**, the Association for Computing Machinery (ACM).

## REFERENCES:

- Available upon request.