

# Irene M. Ong

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## RESEARCH INTERESTS

Data mining and machine learning, particularly Bayesian statistical methods and inductive logic programming (ILP) with applications to biological data. Specifically, focusing on inferring gene regulatory networks as well as methods for scaling up ILP to perform multi-relational data mining on large databases.

## EDUCATION

**University of Wisconsin, Madison, WI.** (June 2007)

PhD in Computer Sciences with minor in bacteriology/genetics.

**Awards:** NIH Biotechnology Training Program (4 year fellowship), NLM Computation and Informatics in Biology and Medicine (1 year fellowship), Google Anita Borg Scholarship Finalist.

**University of Wisconsin, Madison, WI.** (May 2001)

Masters of Science in Computer Sciences

**Cornell University, College of Arts and Sciences, Ithaca, NY.** (August 1997)

BA in Biological Science and Computer Science

**Awards:** Dean's Scholar grant, Dean's List and Gouverneur Foundation Scholarship (4 years).

**Curtin University of Technology, Bentley WA Australia.** (Spring 1996)

Study Abroad program.

**Gouverneur High School, Gouverneur, NY.** (June 1993)

Valedictorian with Honors Regents diploma.

## RESEARCH EXPERIENCE

**Postdoctoral Fellow** *University of Wisconsin Madison, WI.* (June 2007 - Present)

**Awards:** NIH Genome Sciences Training Program (1 year).

**Research Assistant** *University of Wisconsin Madison, WI.* (February 2000 - June 2007)

Developing computational modeling methods using supervised machine learning, statistical analysis and other techniques for identifying and characterizing genes from DNA-arrays as well as other sources of data including measurements of proteins, complexes, phosphorylations and other post-translational modifications.

Performing theoretical analysis of learning dynamic Bayesian networks (DBN) from time series data in order to determine optimal experimental design.

Scaling up Inductive Logic Programming (ILP) by using techniques from the database community to estimate query sizes to enable multi-relational data mining from large databases.

Funding by: DOE (BACTER), NLM (CIBM), U.S. Air Force grant and NIH (BTP)

**Awards:** ICSB Travel grant for presentation at the ISMB 2002 conference.

**Research Assistant** (September 1999 - September 2000)

*University of Wisconsin Madison, WI.*

Developing a high-throughput computing environment using Condor for NMR structure determination programs such as dyana.

**Awards:** NIH Travel grant for a poster presentation at the XIX ICMRBS conference.

## GRANTS

Awarded grant by Women in Science and Engineering Leadership Institute (WISELI) to invite three women speakers for a Distinguished Lecturers in Computational Biology series (2005 - 2006)

## PROFESSIONAL ACTIVITIES

**Program Committee**

International Joint Conference on Artificial Intelligence (IJCAI) 2003 Workshop on Learning Graphical Models for Computational Genomics, August, 2003, Acapulco, Mexico

**Reviewer**

Journal of Artificial Intelligence Research 2007

Bioinformatics 2002, 2003, 2004, 2005, 2006, 2007

Journal of Bioinformatics and Computational Biology 2003

Special issue on Uncertain Reasoning from the German National AI conference 2003

PEER-  
REVIEWED  
PUBLICA-  
TIONS

- I. M. Ong, S. E. Topper, D. Page and V. Santos Costa (2007). Inferring Regulatory Networks from Time Series Expression Data and Relational Data via Inductive Logic Programming *Proceedings of the 16th International Conference on Inductive Logic Programming*, August 2007.
- J. Davis, I. M. Ong, J. Struyf, E. Burnside, D. Page and V. Santos Costa (2007). Change of Representation for Statistical Relational Learning *Proceedings of the 20th International Joint Conference on Artificial Intelligence* Hyderabad, India, January 2007.
- D. Page and I. M. Ong (2006). Experimental Design of Time Series Data for Learning from Dynamic Bayesian Networks *Proceedings of the Pacific Symposium on Biocomputing* 11:267-278 (2006) Wailea, Maui, Hawaii, January 2006.
- I. M. Ong, I. Dutra, D. Page and V. Santos Costa (2005). "Mode Directed Path Finding" *Proceedings of the Sixteenth European Conference on Machine Learning* Portugal, October 2005.
- I. M. Ong, I. Dutra, D. Page and V. Santos Costa (2005). "Hyperpaths: Extending PathFinding to Moded Languages" *Proceedings of the 4th Workshop on Multi-Relational Data Mining at the 11th ACM SIGKDD International Conference on KDD* Chicago, IL, August, 2005.
- J. Bockhorst<sup>†</sup> and I. M. Ong<sup>†</sup> (2004). "FOIL-D: Efficiently Scaling FOIL for Multi-relational Data Mining of Large Datasets." *Proceedings of the 14th International Conference on Inductive Logic Programming*, published as Lecture Notes in Computer Science 3194, Springer 2004, R. Camacho, R. King and A. Srinivasan (Eds.), pp. 63-79, Portugal, September 2004.
- J. Davis, V. Santos Costa, I. M. Ong, D. Page and I. Dutra (2004). "Using Bayesian Classifiers to Combine Rules." *Proceedings of the Third Workshop on Multi-Relational Data Mining at the Tenth ACM SIGKDD International Conference on KDD* Seattle, WA, August, 2004.
- I. M. Ong, J. D. Glasner and D. Page (2002). "Modelling Regulatory Pathways in *E. coli* from Time Series Expression Profiles." *Bioinformatics* 18:241S-248S (2002), special issue from the *Tenth International Conference on Intelligent Systems for Molecular Biology*, Canada, August 2002.

PROFESSIONAL  
EXPERIENCE

**Bioinformatics Scientific Analyst (promotion)** (November 1998 - July 1999)  
**Bioinformatics Software Engineer** (September 1997 - November 1998)  
*SmithKline Beecham, King of Prussia, PA.*

Participated in the development of a web-based application used to perform gene discovery, functional assignment, and expression analysis. Developed java applets that accessed data sources via CORBA and present analyses of ESTs by visualizing sequences, characterizations and alignments. Part of a team involved in creating an interactive genome viewer used to discover novel genes.

**Patent:** Gadget: A Tabular Interface for Genome Browsing (pending)

**Awards:** SmithKline Beecham Bronze Impact Award.

**Service Professional** *Cornell Institute for Biology Teachers.* (September 1996 - August 1997)

Production of plasmids and analysis of DNA for Cornell Institute for Biology Teachers (CIBT).

**Research Assistant** (February - June 1996)

*Genetica Biotechnologies, Tech Park, WA Australia.*

Researched part of a design for a test kit for the detection of lethal pathogenic *C. Albicans* in patients with systemic infection. Utilized: PCR, Immunostaining, Nonradioactive Hybridization, Electroporation, DNA Extraction, Southern Blot, SDS PAGE, and microbiology techniques.

**Lab Technician** *Cornell Biotech, Ithaca, NY.* (March 1994 - December 1995)

Made media and solutions, maintain organization of laboratory, and assisted post-doctoral fellows with their research. Research involved the optimization of transformation using the BIO-RAD gene gun.

**Web Developer** *Proteome Inc., Boston, MA.* (Summer 1995)

Consulted in the installation and development of the web page. Modified C program to manage the yeast genome database for the web.

**Volunteer Web Developer** (January 1995 - March 1995)

*Cornell Division of Biological Science, Ithaca, NY.*

Assisted in the installation and development of biology department's web site.

**Computer Lab Supervisor** *Cornell Comstock Hall.* (August 1994 - December 1994)

Monitored and maintained the Macintosh and PC compatible computing facility.

TEACHING  
EXPERIENCE

- Teaching Assistant for Machine Learning** (January 2003 - May 2003)  
*University of Wisconsin Madison, WI.*  
Lectured one class period on evaluation methodologies, assisted in developing homework and project assignments, graded assignments, held office hours to answer student's questions and made overhead lecture notes available online.
- Volunteer Bioinformatics Instructor for Summer Research Program in Biostatistics** *University of Wisconsin Madison, WI.* (June 2002 - July 2002)  
Lectured and instructed talented minority undergraduate students on the topic of bioinformatics. Developed lab assignments that were suitable for students with varied backgrounds.
- Volunteer Java Tutor** *University of Wisconsin Madison, WI.* (September 1999 - May 2000)  
Tutored students on Java programming methodologies.
- Math Tutor** *Curtin University, WA Australia* (March - June 1996)  
Tutored a college student in the area of mathematics.
- Teaching Assistant** (June - August 1994)  
*EXCEL Program Christopher Newport University, Newport News, VA.*  
Teaching aide for minority middle school students on hands-on science and computer technology. Created an interactive problem solving environment for students to learn about computers and communication.
- Teaching Assistant** (August 1994)  
*SITE Program at CEBAF, Newport News, VA.*  
SITE is a program that teaches teachers methods for more effective teaching. Developed hands-on projects that the teachers could assign as a competition to inspire students to learn.

SERVICE  
ACTIVITIES

- Speaker Series Coordinator of the women chapter of the ACM (WACM) (2005 - 2006)  
Vice President of the women chapter of the ACM (WACM) (2004 - 2005)  
Co-organized chartering of the women in Computer Sciences group as an ACM-W chapter. (2004)  
Helped teach programming in an Exploring Your Horizons workshop for high school girls to harness their interest in computing (2004)  
Computer Sciences Department Graduate Admissions Committee (2003)  
Alumni Affairs of the Student chapter of the ACM (SACM) (2003 - 2004)  
Transition Chair of SACM (2002 - 2003)  
Social Chair of SACM (2000 - 2001)  
TGIF Coordinator of SACM (1999 - 2000)

SKILLS

- Computer: Java, C, CORBA, JDBC, Perl, Pascal, SQL, UNIX, NT, Macintosh, HTML, matlab.  
Coursework: Gene Regulation in Prokaryotes, Advanced Microbial Genetics, Immunology, Prokaryotic Molecular Biology, Learning and Modeling Biological Networks, Intro to Complexity theory, Linear Programming, Intro to Operating Systems, Machine Learning, Advanced Database Systems, Computer Vision, Introduction to Programming Languages and Compilers, Advanced Artificial Intelligence, Advanced Algorithms, Bioinformatics, Introduction to Database Management Systems, Introduction to Artificial Intelligence, Systems Engineering.

REFERENCES

Available upon request.

CITIZENSHIP

United States.