

Laura E. Brown

Department of Computer Science
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Houghton, MI 49931

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RESEARCH INTERESTS

Algorithms for learning Bayesian networks, causal discovery, and variable selection; decision support systems with Bayesian networks; machine learning methods; kernel methods

EDUCATION

Vanderbilt University, Nashville, TN Dec. 2009

Ph.D., Department of Biomedical Informatics

“Novel Methods for Variable Selection in Non-Faithful Domains, Understanding Support Vector Machines, Learning Regions of Bayesian Networks, and Prediction Under Manipulation”

Advisor: Dr. Ioannis Tsamardinos & Dr. Douglas Hardin

M.S., Department of Biomedical Informatics May 2005

“An Empirical Evaluation of State-of-the-Art and Novel Bayesian Network Learning Algorithms”

University of Michigan, Ann Arbor, MI Aug. 2002

M.S.E., Department of Electrical Engineering and Computer Science

Swarthmore College, Swarthmore, PA May 2000

B.S., Department of Engineering with concentration in Computer Science

PROFESSIONAL EXPERIENCE

Assistant Professor Jan. 2010 - Present

Dept. of Computer Science, Michigan Technological University, Houghton, MI

Lecturer Aug. 2009 – Dec. 2009

Dept. of Computer Science, Michigan Technological University, Houghton, MI

Graduate Research Assistant Aug. 2002 – Aug. 2009

Dept. of Biomedical Informatics, Vanderbilt University, Nashville, TN

Research supervisors: Dr. Ioannis Tsamardinos & Dr. Douglas Hardin

Graduate Student Research Assistant May 2001 - Aug. 2002

Dept. of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI

Research supervisor: Dr. Martha Pollack

RESEARCH ACTIVITIES & GRANTS

Grants in Preparation

Predicting End-of-Life Survival in Adult Out-Patient Oncology Patients using Laboratory Trend Data, L.E.Brown (co-PI), B.Decker (co-PI), NIH

TEACHING & MENTORING EXPERIENCE

Student Advising

John Earnest, M.S. Student, Computer Science, *Advisor*

Jason Hiebel, M.S. Student, Computer Science, *Advisor*

Bryan Franklin, Ph.D. Student, Computer Science, *Co-Advisor*

Muhammad Ali, Ph.D. Candidate, Electrical and Computer Engineering, *Committee Member*

Assistant Professor & Lecturer

Aug. 2009 - Present

Dept. of Computer Science, Michigan Technological University, Houghton, MI

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|--|-------------|
| Discrete Structures (cs2311) | Spring 2011 |
| Artificial Intelligence (cs4811) | Spring 2011 |
| Directed Study (cs4099) <i>Topic: Bayesian Networks, (1 credit)</i> | Spring 2011 |
| Discrete Structures (cs2311) | Fall 2010 |
| Directed Study (cs4099) <i>Topic: AI and Machine Learning, (3 credits)</i> | Fall 2010 |
| Artificial Intelligence (cs4811) | Spring 2010 |
| Discrete Structures (cs2311) | Fall 2009 |

Teaching Assistant

Aug. 2006 – May 2009

Dept. of Biomedical Informatics, Vanderbilt University, Nashville, TN

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|---|-------------------------|
| Machine Learning for Biomedicine (BMIF 330/CS 396) | Spring 2008, 2009 |
| Methodological Foundations of Biomedical Informatics (BMIF 315) | Spring 2007, 2008, 2009 |
| Foundations in Biomedical Informatics (BMIF 300) | Fall 2006, 2007 |
| Biomedical Artificial Intelligence and Laboratory (BMIF 330) | Spring 2006 |

Graduate Student Instructor (GSI)

Aug. 2000 – May 2001

Dept. of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI

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| Introduction of Digital Logic, Head GSI (EECS 270) | Fall 2000, Spring 2001 |
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Academic Tutor and Grader

Aug. 1998 – May 2000

Dept. of Engineering, Swarthmore College, Swarthmore, PA

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| Graded several courses, coordinated and worked at engineering clinic | Fall 1998 – Spring 2000 |
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PUBLICATIONS

Under Preparation or Review

L.E. Brown, I.Tsamardinos, D. Hardin, "Seeking a Minimal-Size, Optimally Predictive Set of Lower and Higher Order Terms in Polynomial Support Vector Machines" *Submitted*, 2011.

S. Pratap*, **L.E. Brown***, E. Pawelczyk, B.J. Nowicki, A. Hart, M.G. Izban, and S. Nowicki, "TLR4 and CD55 Dual Biomarker Mixed Model for Enhanced Prediction of Spontaneous Preterm Labor", *In Preparation*, 2011 * denotes equal contribution

Book Chapters

L.E. Brown, I. Tsamardinos, "A Strategy for Making Predictions Under Manipulation." in Challenges in Causality Volume 1: Causation and Prediction Challenge Eds. I. Guyon, et al., Microtome Publishing, 2009.

A. Statnikov, I. Tsamardinos, **L.E. Brown**, C.F. Aliferis, "Causal Explorer: A Matlab Library of Algorithms for Causal Discovery and Variable Selection for Classification" in Challenges in Causality Volume 1: Causation and Prediction Challenge Eds. I. Guyon, et al., Microtome Publishing, 2009.

Conference Poster or Abstract

L.E. Brown, B. Decker, "Predicting End-of-Life Survival in Adult Oncology Patients Using Trend Data", in Proceedings of American Medical Informatics Association Symposium (AMIA), p. 991, Nov. 2010.

L.E. Brown, B. Decker, P. Decker, "Predicting Length of Survival in Adult Oncology Patients" in Proceedings of Great Lake Bioinformatics Conference (GLBIO), May 2011.

Peer-Reviewed Papers and Proceedings

L.E. Brown, I. Tsamardinos, D. Hardin, "To Feature Space and Back: Identifying Top-Weighted Features in Polynomial Support Vector Machines", To Appear, Intelligent Data Analysis, 2011.

K. Bunker, R. Rebb, **L.E. Brown**, G. Hein, N. Onder, "Why do Women Engineering and Computer Science Undergraduates Persist in their Major?", in Proceedings of WEPAN Annual Conference, June 2011.

L.E. Brown, I. Tsamardinos, "A Strategy for Making Predictions Under Manipulation" JMLR W&CP 3:35-52, 2008.

I. Tsamardinos, **L.E. Brown**, "Bounding the False Discovery Rate in Local Bayesian Network Learning" in Proceedings of the 23rd Conference on Artificial Intelligence (AAAI), July 2008.

J.W. Dexheimer, **L.E. Brown**, J. Leegon, D. Aronsky, "Comparing Decision Support Methodologies for Identifying Asthma Exacerbations" in Proceedings of 12th World Congress on Medical Informatics (MEDINFO), August 2007.

I. Tsamardinos, **L.E. Brown**, C.F. Aliferis, "The Max-Min Hill-Climbing Bayesian Network Structure Learning Algorithm" Machine Learning **65** (1): 31-78, Oct. 2006.

I. Tsamardinos, A. Statnikov, **L.E. Brown**, C.F. Aliferis, "Generating Realistic Large Bayesian Networks by Tiling" in Proceedings of the 19th International Florida Artificial Intelligence Research Society Conference (FLAIRS), May 2006.

L.E. Brown, I. Tsamardinos, C.F. Aliferis, "A Comparison of Novel and State-of-the-Art Polynomial Bayesian Network Learning Algorithms" in Proceedings of the 20th National Conference on Artificial Intelligence (AAAI), July 2005.

L.E. Brown, I. Tsamardinos, C.F. Aliferis, "A Novel Algorithm for Scalable and Accurate Bayesian Network Learning" in Proceedings of the 11th World Congress on Medical Informatics (MEDINFO), Sept. 2004.

C.F. Aliferis, I. Tsamardinos, A. Statnikov, **L.E. Brown**. "Causal Explorer: A Probabilistic Network Learning Toolkit for Biomedical Discovery" in Proceedings of the 2003 International Conference on Mathematics and Engineering Techniques in Medicine and Biological Sciences (METMBS), June 2003.

M.E. Pollack, **L.E. Brown**, D. Colbry, C. E. McCarthy, C. Orosz, B. Peintner, S. Ramakrishnan, and I. Tsamardinos, "Autominder: An Intelligent Cognitive Orthotic System for People with Memory Impairment" *Robotics and Autonomous Systems*, **44**(3-4) p.273-282, 2003.

M.E. Pollack, S.Enberg, J.T. Matthews, S. Thrun, **L.E. Brown**, D. Colbry, C. Orosz, B. Peintner, S. Ramakrishnan, J. Dunbar-Jacob, C. McCarthy, M. Montenerlo, J. Pineau, N. Roy, "Pearl: A Mobile Robotic Assistant for the Elderly," in *AAAI Workshop on Automation as Eldercare*, Aug. 2002.

M.E. Pollack, C.E. McCarthy, I. Tsamardinos, S. Ramakrishnan, **L.E. Brown**, S. Carrion, D. Colbry, C. Orosz, B. Peintner, "Autominder: A Planning, Monitoring and Reminding Assistive Agent," in *Proceedings of 7th International Conference on Intelligent Autonomous Systems (IAS-7)*, 2002.

B.A. Maxwell, L.A. Meeden, N. Addo, **L.E. Brown**, P. Dickson, J. Ng, S. Olshfski, E. Silk, and J. Wales, "Alfred: The Robot Waiter Who Remembers You," in *Proceedings of AAAI Workshop on Robotics*, July 1999.

Technical Reports

L.E. Brown, I. Tsamardinos, C.F. Aliferis, "Learning Bayesian Network Regions: Local and Global Approaches", *TR-DSL-09-01*, 2009.

L.E. Brown, I. Tsamardinos, "Markov Blanket-Based Variable Selection in Feature Space" *Technical Report DSL-08-01*, 2008.

I. Tsamardinos, C.F. Aliferis, A. Statnikov, **L.E. Brown**, "Scaling-up Bayesian Network Learning to Thousands of Variables Using Local Learning Technique" *Technical Report DSL-TR-03-02*, Mar. 2003.

AWARDS

National Library of Medicine Trainee

Fall 2002-Spring 2006

University of Michigan Summer Research Fellowship

Summer 2001

PROFESSIONAL ACTIVITIES

Member

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|---|--------------|
| Association for the Advancement of Artificial Intelligence (AAAI) | 2001-Present |
| American Medical Informatics Association (AMIA) | 2003-Present |
| Institute of Electrical and Electronic Engineers (IEEE) | 1998-2000 |
| International Society of Computational Biology | 2011-Present |
| Society of Women Engineers (SWE) | 1996-2000 |
| Women in Engineering ProActive Network | 2011-Present |

Reviewer for Journal or Conference Proceedings (last five years, within last two years)*

Association for the Advancement of Artificial Intelligence (AAAI)
 *American Medical Informatics Association (AMIA)
 *BMC Bioinformatics
 *European Symposium on Artificial Neural Networks (ESANN)
 Florida Artificial Intelligence Research Society Conference (FLAIRS)
 *Journal of the American Medical Informatics Association (JAMIA)
 *Journal of Machine Learning Research (JMLR)
 *Methods of Information in Medicine

Program Committee

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| Great Lakes Bioinformatics Conference 2011 (GLBIO) | 2011 |
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Other

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| Reviewer Grace Hopper Travel Applications | 2010 |
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