Rebecca A. Hutchinson

CONTACT INFORMATION

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RESEARCH INTERESTS

Machine learning; computational sustainability; graphical models; time series modeling; learning from high-dimensional, sparse, noisy data; functional Magnetic Resonance Image (fMRI) data analysis; applications of machine learning to real-world problems.

EDUCATION

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

Ph.D. Candidate, Computer Science Department, September 2002 - present

- Dissertation Topic: "Hidden Process Models"
- Advisor: Tom M. Mitchell

Bucknell University, Lewisburg, Pennsylvania USA

B.S.E., Computer Science and Engineering, May, 2002

- Summa Cum Laude

HONORS AND AWARDS

National Science Foundation Graduate Research Fellowship, 2002-2005

Bucknell Computer Science Department Most Outstanding Senior Award, 2002

Barry M. Goldwater Scholar, 2001

National Merit Scholar, 1998

EXPERIENCE

Oregon State University, Corvallis, Oregon USA

Faculty Research Assistant *January, 2009 - present*
Conducting research in computational sustainability as a post-doc with Tom Dietterich. Exploring the role of machine learning in topics such as species distribution modeling, decision support for policy makers, natural resource economics, etc.

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

Graduate Student *September, 2002 - present*
Conducting Ph.D. research as a member of the Brain Image Analysis Research Group (led by Tom M. Mitchell). Completed Ph.D. coursework, and writing/speaking requirements.

Co-advisor *September, 2006 - May, 2007*
Co-advised (with Tom M. Mitchell) an undergraduate senior honors thesis.

Teaching Assistant *January - May, 2007*
TA for Artificial Intelligence (undergraduate level). Worked with 3 other TAs and 2 instructors to develop, test, and grade homeworks and exams. Held weekly office hours.

Teaching Assistant *September - December, 2006*
TA for Machine Learning (undergraduate/master's level). Worked with 1 other TA and the instructor to develop and grade homeworks and exams. Held weekly office hours.

BodyMedia, Inc., Pittsburgh, Pennsylvania USA

Summer Intern *June - August, 2005*
Developed machine learning methods for a body monitoring device with 5 sensors worn on the arm.

Refereed Publications

"Modeling fMRI data generated by overlapping cognitive processes with unknown onsets using Hidden Process Models," R. Hutchinson, R.S. Niculescu, T.A. Keller, I. Rustandi, and T.M. Mitchell, *NeuroImage* (2009), doi:10.1016/j.neuroimage.2009.01.025.

"Hidden Process Models," R. Hutchinson, T.M. Mitchell, I. Rustandi, Proceedings of the *International Conference on Machine Learning*, 2006.

"Learning to Decode Cognitive States from Brain Images," T.M. Mitchell, R. Hutchinson, R.S. Niculescu, F.Pereira, X. Wang, M. Just, and S. Newman, *Machine Learning*, Vol. 57, Issue 1-2, pp. 145-175. October 2004.

"Training fMRI Classifiers to Detect Cognitive States across Multiple Human Subjects," X. Wang, R. Hutchinson, and T. M. Mitchell, Proceedings of *Neural Information Processing Systems*, 2003.

"Classifying Instantaneous Cognitive States from fMRI Data," T. Mitchell, R. Hutchinson, M. Just, R.S. Niculescu, F. Pereira, X. Wang, Proceedings of the *American Medical Informatics Association* Symposium, 2003. **(received Best Foundational Paper Award)**

"Reducing Boundary Friction Using Translation-Fragment Overlap," R. Brown, R. Hutchinson, P. Bennett, J. G. Carbonell, and P. Jansen. Proceedings of the *Machine Translation Summit IX*, 2003.

Technical Reports and Working Papers

"Hidden Process Models," R. Hutchinson, Thesis Proposal, May, 26, 2006.

"Hidden Process Models," T.M. Mitchell, R. Hutchinson, and I. Rustandi. Carnegie Mellon University Technical Report CS-CALD-05-116. February 17, 2006.

"Maximal Lattice Overlap in Example-Based Machine Translation," R. Hutchinson, P.N. Bennett, J. Carbonell, P. Jansen, and R. Brown. Carnegie Mellon University Technical Report CMU-CS-03-138. June 6, 2003.

Talks and Posters

"Hidden Process Models with Applications to fMRI Data," Topic Contributed Session, *Joint Statistical Meetings* 2009, Washington, DC, August 2, 2009.

"Species Distribution Modeling with Uncertain Detection," Eco-Informatics Summer Institute Computer Science Seminar, Oregon State University, Corvallis, OR, July 20, 2009.

"Modeling fMRI data generated by overlapping cognitive processes with unknown onsets using Hidden Process Models," (poster with T.M. Mitchell), *Statistical Analyses of Neuronal Data* Workshop 2008, Pittsburgh, PA, May 30, 2008.

"Hidden Process Models for Analyzing fMRI Data," Graduate Student Seminar Series, Carnegie Mellon School of Computer Science, May 11, 2007.

"Hidden Process Models: Decoding Overlapping Cognitive States with Unknown Timing," *Neural Information Processing Systems* Workshops: New Directions on Decoding Mental States from fMRI Data, Vancouver, BC, December 8, 2006.

"Hidden Process Models," *Women in Machine Learning* Workshop, San Diego, CA, October 4, 2006.

"Hidden Process Models," *International Conference on Machine Learning* 2006, Pittsburgh, PA, June 28, 2006.

"Hidden Process Models," Thesis Proposal, Carnegie Mellon Computer Science Department, May 26, 2006.

"Learning to Identify Overlapping and Hidden Cognitive Processes from fMRI Data," (poster with T.M. Mitchell and I. Rustandi), *Human Brain Mapping* 2005, Toronto, ON, June 2005.

"Using Hidden Process Models to Decode Cognitive States from fMRI Data," Brain Science Seminar, Carnegie Mellon Univerity, April 2005.

"Hidden Process Models for Body Monitoring Data," BodyMedia, Inc., Pittsburgh, PA, March 2005.

Service

Reviewer for NeuroImage (2009).

Reviewer for the *International Conference on Machine Learning* (ICML) 2007.

Program Committee Member and Reviewer for the 1st annual *NorthEast Student Colloquium on Artificial Intelligence* (NESCAI) 2006.

Reviewer for the *Women in Machine Learning* Workshop (WIML) 2006.