

Jesse Davis

Graduate Student and Research Assistant
Computer Sciences
University of Wisconsin-Madison

Office: 6765 Medical Science Center
Telephone: (608) 263-7622
Email: jdavis at cs dot wisc dot edu

Mailing Address

Computer Sciences & Statistics
1210 West Dayton Street
Madison, WI 53706

Research

I am co-advised by C. David Page Ph.D and Dr. Elizabeth Burnside. I also worked closely with Ines Dutra Ph.D and Vitor Santos Costa Ph.D who spent 2004-2005 in Madison as visiting faculty. They were on leave from the Federal University of Rio de Janeiro. My research focuses on solving problems in biological and clinical domains through the development of novel machine learning and data mining techniques. I have developed a state-of-the-art Statistical Relational Learning framework that is broadly applicable to clinical and biological problems. The framework has been shown to increase the accuracy of learned models and has made novel clinical discoveries. Thus far, I have focused on two application domains: providing a decision support system for radiologists who read mammograms and predicting three-dimensional Quantitative Structure-Activity Relationships (3D-QSAR) for drug design.

Software

Mark Goadrich and I have written a java package for generate ROC and Precision Recall curves. It can also calculate the area under the curve. The jar file is available [here](#). For more information about ROC and PR curves, see our paper at ICML 2006.

Publications

Refereed Conferences

- Jesse Davis, Vitor Santos Costa, Soumya Ray and David Page (2007). An Integrated Approach to Feature Construction and Model Building for Drug Activity Prediction. To appear in the Proceedings of the 24th International Conference on Machine Learning (ICML).
- Jesse Davis, Irene Ong, Jan Struyf, Elizabeth Burnside, David Page and Vitor Santos Costa (2007). Change of Representation for Statistical Relational Learning. In the Proceedings of the 20th International Joint Conference on Artificial Intelligence (IJCAI)
- Jesse Davis and Mark Goadrich (2006). The Relationship Between Precision-Recall and ROC Curves. In the Proceedings of the 23rd International Conference on Machine Learning (ICML).
- Jan Struyf, Jesse Davis and David Page (2006). An Efficient Approximation to Lookahead in Relational Learners. In the Proceedings of the 17th European Conference on Machine Learning (ECML).

- Jesse Davis, Elizabeth Burnside, Ines Dutra, David Page, Raghu Ramakrishnan, Vitor Santos Costa and Jude Shavlik (2005). View Learning for Statistical Relational Learning: With an Application to Mammography. In the Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI).

- Jesse Davis, Ines Dutra, David Page and Vitor Santos Costa (2005). Establishing Identity Equivalence in Multi-Relational Domains. In the Proceedings of the International Conference on Intelligence Analysis. Available as postscript, PDF or Word. Winner of the Best Technical Paper award.

- Elizabeth S. Burnside, Jesse Davis, Vitor Santos Costa, Ines Dutra, Charles E. Kahn Jr., Jason P. Fine and David Page (2005). Knowledge Discovery from Structured Mammography Reports Using Inductive Logic Programming. In the Proceeding of the American Medical Informatics Association Annual Symposium (AMIA) .

- Jesse Davis, Elizabeth Burnside, Ines Dutra, David Page, Vitor Santos Costa (2005). An Integrated Approach to Learning Bayesian Networks of Rules. In the Proceedings of the European Conference of Machine Learning (ECML).

Book Chapters

- Jesse Davis, Elizabeth Burnside, Ines Dutra, David Page, Raghu Ramakrishnan, Vitor Santos Costa and Jude Shavlik (2006). Learning a New View of a Database: With an Application to Mammography. To appear in L. Getoor and B. Taskar, editors, An Introduction to Statistical Relational Learning, MIT Press.

Refereed Workshops

- Jesse Davis, Elizabeth Burnside, David Page and Vitor Santos Costa (2006). View Learning Extended: Inventing New Tables for Statistical Relational Learning. In the Proceedings of Open Problems in Statistical Relational Learning Workshop (SRL2006). In conjunction with ICML 2006.

- Jesse Davis, Vitor Santos Costa, Irene Ong, David Page and Ines Dutra (2004). Using Bayesian Classifiers to Combine Rules. Appears in the Proceedings of the 3rd Workshop on Multi-Relational Data Mining (MRDM 2004). In conjunction with KDD 2004.

Professional Service

- Reviewer for Machine Learning (2007)
- Reviewer for the 20th Int'l. Joint Conference on Artificial Intelligence (IJCAI-07)
- Reviewer for ACM Transactions on Computational Logic (2006)

Past Teaching Experience

- Spring 2003: Discussion Leader for CS302: Introduction to Programming Sections 303 and 304.
- Fall 2002: Discussion Leader for for CS302: Introduction to Programming Section 314.

Education

- M.S. in Computer Science, University of Wisconsin, Madison, May 2005.
- B.A. in Computer Science, from Williams College, June 2002.

Courses taken:

Spring 2005

- CS784: Data Models and Languages with Raghu Ramakrishnan.
- Genetics 466: General Genetics.

Fall 2004

- CS520: Introduction to Theoretical Computer Science with Jin-Yi Cai.
- CS701: with Susan Horwitz.

Spring 2004

- MATH541: Modern Algebra 1 with Arnold Johnson
- MATH475: Combinatorics with James Propp

Fall 2003

- CS576: Introduction to Bioinformatics with Mark Craven.
- CS764: Topics in Database Systems with Jeffrey Naughton.

Spring 2003

- CS760: Machine Learning with Jude Shavlik.
- CS564: Database Management Systems: Design & Implementation with J. Naughton.

Fall 2002

- CS537: Introduction to Operating Systems with Marvin Solomon.
- CS731: Advanced Artificial Intelligence with Biomedical Applications with David Page.