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## Research Interests

- Artificial Intelligence
- Machine Learning
- Data Mining
- Neural Networks
- Reinforcement Learning
- Computational Biology

## Some Links

- Class Pages
- Publications
- Student Publications
- Information on Graduate School
- Research and Resource Links
- Other Useful Links

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## Gene Cluster Annotation Tool

## Recent Publications

- **Gautam Kunapuli, Rich Maclin & Jude Shavlik (2011).**
  Advice Refinement for Knowledge-Based Support Vector Machines. *Proceedings of the Twenty-Fifth Conference on Neural Information Processing Systems (NIPS 2011).*
- **G. Kunapuli, R. Maclin & J. Shavlik (2011).**
  Advice Refinement for Knowledge-Based Support Vector Machines. *Workshop on Combining Learning Strategies for Reducing Label Cost at ICML 2011.*
- **Gautam Kunapuli, Kristin P. Bennett, Rich Maclin & Jude Shavlik (2010).**
  The Adviceptron: Giving Advice To The Perceptron. *Proceedings of the Conference on Artificial Neural Networks In Engineering (ANNIE 2010)*, St. Louis, MO.
- **Trevor Walker, Ciaran O'Reilly, Gautam Kunapuli, Sriraam Natarajan, Richard Maclin, David Page & Jude Shavlik (2010).**
  Automating the ILP Setup Task: Converting User Advice about Specific Examples into General Background Knowledge. *Proceedings of the 20th International Conference on Inductive Logic Programming*, Florence, Italy.
- **G. Kunapuli, K.P. Bennett, A. Shabbeer, R. Maclin & J. Shavlik (2010).**
  Online Knowledge-Based Support Vector Machines. *Proceedings of the European Conference on Machine Learning (ECML 2010)*, Barcelona, Spain.
- **S. Natarajan, G. Kunauli, R. Maclin, D. Page, C. O'Reilly, T. Walker & J. Shavlik (2010).**
  Learning from Human Teachers: Issues and Challenges in Bootstrap Learning. *AAMAS 2010 Workshop on Agents Learning Interactively from Human Teachers*, Toronto, Canada.
- **L. Torrey, J. Shavlik, T. Walker & R. Maclin (2009).**
  Transfer Learning via Advice Taking. In J. Koronacki, S. Wirzchon, Z. Ras & J. Kacprzyk, editors, *Recent Advances in Machine Learning, dedicated to the memory of Ryszard S. Michalski.* Springer Studies in Computational Intelligence.
- **S. Natarajan, G. Kunapuli, C. O'Reilly, R.Maclin, T. Walker, D. Page & J.Shavlik (2009).**
  ILP for Bootstrapped Learning: A Layered Approach to Automating the ILP Setup Problem. Presented at the *Nineteenth Conference on Inductive Logic Programming*, Leuven, Belgium.
- **L. Torrey, J. Shavlik, T. Walker & R. Maclin (2008).**
  Rule Extraction for Transfer Learning. In J. Diederich, editor, *Rule Extraction from Support Vector Machines,* pp. 67-82. Springer.
- **L. Torrey, T. Walker, R. Maclin & J. Shavlik (2008).**
  Advice Taking and Transfer Learning: Naturally Inspired Extensions to Reinforcement Learning. *AAAI Fall Symposium on Naturally Inspired AI*, Washington, DC.
- **R. Maclin, E. Wild, J. Shavlik, L. Torrey and T. Walker (2007).**
  Refining Rules Incorporated into Knowledge-Based Support Vector Learners Via Successive Linear Programming (PDF) . *Proceedings of the Twenty Second National Conference on Artificial Intelligence (AAAI'07)*, Vancouver, BC.
- **L. Torrey, J. Shavlik, T. Walker and R. Maclin (2007).**
  Relational Macros for Transfer in Reinforcement Learning. (PDF) . *Proceedings of the Seventeenth Conference on Inductive Logic Programming (ILP'07)*, Corvallis, Oregon.
- **T. Walker, L. Torrey, J. Shavlik, and R. Maclin (2007).**
  Building Relational World Models for Reinforcement Learning. (PDF) . *Proceedings of the Seventeenth Conference on Inductive Logic Programming (ILP'07)*, Corvallis, Oregon.
- **R. Maclin, J. Shavlik, T. Walker and L. Torrey (2006).**
  A Simple and Effective Method for Incorporating Advice into Kernel Methods (PDF) . *Proceedings of the Twenty First National Conference on Artificial Intelligence (AAAI'06)*, Boston, MA.

- **L. Torrey, J. Shavlik, T. Walker and R. Maclin (2006).** Skill Acquisition via Transfer Learning and Advice Taking. (PDF) . *Proceedings of the Seventeenth European Conference on Machine Learning (ECML'06)*, Berlin, Germany.
- **R. Maclin, J. Shavlik, L. Torrey, T. Walker and E. Wild (2005).** Giving Advice about Preferred Actions to Reinforcement Learners Via Knowledge-Based Kernel Regression (PDF) . *Proceedings of the Twentieth National Conference on Artificial Intelligence (AAAI'05)*, Pittsburgh, PA.
- **R. Maclin, J. Shavlik, L. Torrey and T. Walker (2005).** Knowledge Based Support Vector Regression for Reinforcement Learning (PDF) . *IJCAI'05 Workshop on Reasoning, Representation, and Learning in Computer Games*, Edinburgh, Scotland.
- **L. Torrey, T. Walker, J. Shavlik and R. Maclin (2005).** Using Advice to Transfer Knowledge Acquired in One Reinforcement Learning Task to Another. (PDF) . *Proceedings of the Sixteenth European Conference on Machine Learning (ECML'05)*, Porto, Portugal.
- **L. Torrey, T. Walker, J. Shavlik and R. Maclin (2005).** Knowledge Transfer Via Advice Taking (PDF) . *Proceedings of the Third International Conference on Knowledge Capture (KCAP'05)*, Banff, Canada. Poster (PDF). Abstract.
- **M. Joshi, T. Pedersen and R. Maclin (2005).** A Comparative study of support vector machines applied to the supervised word sense disambiguation problem in the medical domain (PDF) . *Proceedings of the 2nd Indian International conference on Artificial Intelligence (IICAI-05)*, Pune, India.
- **T. Walker, J. Shavlik and R. Maclin (2004).** Relational Reinforcement Learning via Sampling the Space of First-Order Conjunctive Features (PDF) . *Proceedings of the ICML Workshop on Relational Reinforcement Learning*, Banff, Canada.
- **Bennett, K., Demiriz, A. and Maclin, R. (2002).** Exploiting Unlabeled Data in Ensemble Methods (PDF) *Proceedings of the Eighth ACM SIGKDD Internation Conference on Knowledge Discovery and Data Mining*, Edmonton, Alberta, Canada.
- **Opitz, D. and Maclin, R. (1999).** Popular ensemble methods: An empirical study (PDF) (Postscript) . *Journal of AI Research*, 11, 169-198.
- **Maclin, R. (1998).** Boosting classifiers regionally. (PDF) (Postscript) . *Proceedings of the Fifteenth National Conference on Artificial Intelligence*, pp. 700-705, Madison, WI.
- **Maclin, R. and Shavlik, J. W. (1998).** Creating advice-taking reinforcement learners. (PDF) (Postscript) . in S. Thrun and L. Pratt (eds) *Learning to Learn*, Kluwer Academic.
- **Maclin, R. and Opitz, D. (1997).** An empirical comparison of bagging and boosting. (PDF) (Postscript) . *Proceedings of the Fourteenth National Conference on Artificial Intelligence*, Providence, RI.
- **Asker, L. and Maclin, R. (1997).** Feature engineering and classifer selection: A case study in Venusian volcano detection. (PDF) (Postscript) . *Proceedings of the Fourteenth International Conference on Machine Learning*, Nashville, TN.
- **Asker, L. and Maclin, R. (1997).** Ensembles as a sequence of classifiers. (PDF) (Postscript) . *Proceedings of the Fifteenth International Joint Conference on Artificial Intelligence*, Nagoya, Japan.
- **Maclin, R. and Shavlik, J. W. (1996).** Creating advice-taking reinforcement learners. (PDF) (Postscript) . *Machine Learning*, 22, 251-281.

- **Maclin, R. and Shavlik, J. W. (1995).**
  Combining the predictions of multiple classifiers: Using competitive learning to initialize neural networks. (PDF) (Postscript) . *Proceedings of the Fourteenth International Joint Conference on Artificial Intelligence*, Montreal, Canada.
- **Maclin, R. (1995).**
  Learning from Instruction and Experience: Methods for Incorporating Procedural Domain Theories into Knowledge-Based Neural Networks. Ph.D. Thesis, Department of Computer Sciences, University of Wisconsin-Madison. (Also appears as UW Technical Report CS-TR-95-1285)
  First half (Postscript)
  First half (PDF)
  Second half (Postscript)
  Second half (PDF)
- **Maclin, R. and Shavlik, J. W. (1994).**
  Incorporating Advice into Agents that Learn from Reinforcements. (PDF) (Postscript) . *Proceedings of the Twelfth National Conference on Artificial Intelligence*, pp. 694-699, Seattle, WA. (A longer version appears as UW-CS TR 1227 (PDF) (Postscript) .)
- **Maclin, R. and Shavlik, J. W. (1993).**
  Using Knowledge-Based Neural Networks to Improve Algorithms: Refining the Chou-Fasman Algorithm for Protein Folding. (PDF) (Postscript) . *Machine Learning, 11 (2/3),* pp. 195-215. Other versions of this paper appear in the *Proceedings of the Tenth National Conference on Artificial Intelligence*, 1992, pp. 165-170, and in Hanson, S., Drastal, G. and Rivest, R., eds., *Computational Learning Theory and Natural Learning Systems*, 1994, MIT Press.
- **Maclin, R. and Shavlik, J. W. (1991).**
  Refining Domain Theories Expressed as Finite-State Automata. (PDF) (Postscript) . *Machine Learning: Proceedings of the Eighth International Conference* , pp. 524-528, Chicago, IL.
- **Stewart, J. and Maclin, R. (1990).**
  Representing Genotype-to-Phenotype Mappings. *Journal of Biological Education, 24 (2),* pp. 113-116.
- **Maclin, R. and Shavlik, J. W. (1989).**
  Enriching Vocabularies Using Explanation-Based Learning. *Machine Learning: Proceedings of the Sixth International Conference* , pp. 444-446, Ithaca, NY.
- **Koedinger, K., Maclin, R., Streibel, M. and Stewart, J. (1987).**
  Intelligent Tutoring Systems Design Issues for a Genetics Laboratory Called MENDEL. *Proceedings of the Third International Conference on Artificial Intelligence and Education* , Pittsburgh, PA.