

Justin A. Boyan

Massachusetts Institute of Technology
Artificial Intelligence Lab
545 Technology Square NE43-753
Cambridge, MA 02139

Email: jboyan@arc.nasa.gov
Web: <http://ic.arc.nasa.gov/people/jboyan>
Phone: (617)-253-8005
Fax: (617)-253-7781

Research Projects / Systems Developed

- 2000- **Adaptive Control of NASA Life Support Systems**
- 2000 **Internet Auction Trading Strategies**
- 1999- **Optimal Route Planning Under Time-Dependent Uncertainty**
- 1996- **Learning Evaluation Functions for Global Optimization**
- 1994- **Scaling Up Reinforcement Learning / Value Function Approximation**
- 1996 **Information Retrieval / Web Indexing / Machine Learning**
- 1995-96 **Anonymizing Proxy System for the World Wide Web**
- 1993-94 **Reinforcement Learning for Network Routing / Multi-Agent Learning**
- 1992-93 **Artificial Neural Network algorithms**
- 1992-94 **Self-Learning Backgammon Software**
- 1986-95 **Sole proprietor, BOYAN Communications**

Chronology

- **NASA Ames Research Center**, Research Scientist, September 1998-present.
 - Visiting Scientist, **MIT AI Lab**, January 2000-present.
 - Group affiliation at Ames: Autonomy and Robotics Area, Computational Sciences Division
- **Carnegie Mellon University, Ph.D., Computer Science**, August 1998; **M.S.**, May 1995.
- **University of Cambridge, M.Phil.**, Computer Speech and Language Processing, August 1992.
- **University of Chicago, B.S.** with General Honors, Mathematics, June 1991.

Professional Activities / Teaching

- 2000-2003 Editorial Board, *Machine Learning Journal*
- 1995 Teaching Assistant, *How to Think (Like a Computer Scientist)*
- 1993 Teaching Assistant, *Artificial Neural Networks* (graduate course)
- 1992-1997 Organizer, CMU Reinforcement Learning Group
- 1986-93 Mathematics teacher, Johns Hopkins University *Center for Talented Youth* residential summer program

Selected Refereed Publications

- [1] Boyan, J. A. and M. Mitzenmacher. "Improved Results for Route Planning in Stochastic Transportation Networks." Accepted to the *12th Annual Symposium on Discrete Algorithms (SODA)*, 2001.
- [2] Boyan, J. A. and M. L. Littman. "Exact Solutions to Time-Dependent MDPs." To appear in *Advances in Neural Information Processing Systems (NIPS)*. MIT Press, 2001.
- [3] Boyan, J. A. and A. W. Moore. "Learning Evaluation Functions to Improve Local Search." *Journal of Machine Learning Research*, to appear, 2000.
- [4] Boyan, J. A. "Technical Update: Least-Squares Temporal Difference Learning." *Machine Learning Journal*, to appear, 2000.
- [5] Boyan, J. A. "Least-Squares Temporal Difference Learning." In Bratko, I., and Dzeroski, S., eds., *Machine Learning: Proceedings of the Sixteenth International Conference (ICML)*, 1999.
- [6] Boyan, J. A. and A. W. Moore. "Learning Evaluation Functions for Global Optimization and Boolean Satisfiability." *Fifteenth National Conference on Artificial Intelligence (AAAI)*, 1998.
- [7] Schneider, J. G., J. A. Boyan and A. W. Moore. "Value Function Based Production Scheduling." *Machine Learning: Proceedings of the Fifteenth International Conference (ICML)*, 1998.
- [8] Moore, A. W., J. G. Schneider, J. A. Boyan and M. S. Lee. "Q2: Memory-Based Active Learning for Optimizing Noisy Continuous Functions." *Machine Learning: Proceedings of the Fifteenth International Conference (ICML)*, 1998.
- [9] Boyan, J. A. "The Anonymizer: Protecting User Privacy on the Web." *Computer-Mediated Communication Magazine*, 4 (9), September 1997.
- [10] Boyan, J. A. and A. W. Moore. "Using Prediction to Improve Combinatorial Optimization Search." *Sixth International Workshop on Artificial Intelligence and Statistics (AISTATS)*, 1997.
- [11] Boyan, J. A. and A. W. Moore. "Learning Evaluation Functions for Large Acyclic Domains." In L. Saitta (ed.), *Machine Learning: Proceedings of the Thirteenth International Conference (ICML)*. Morgan Kaufmann, 1996.
- [12] Boyan, J. A., and A. W. Moore, "Generalization in Reinforcement Learning: Safely Approximating the Value Function." In Tesauro, G., D. S. Touretzky, and T. K. Leen (eds.), *Advances in Neural Information Processing Systems 7 (NIPS)*. MIT Press, 1995.
- [13] Boyan, J. A., and M. L. Littman, "Packet routing in dynamically changing networks: A reinforcement learning approach." In Cowan, J. D., Tesauro, G., and Alspector, J. (eds.), *Advances in Neural Information Processing Systems 6 (NIPS)*. Morgan Kaufmann, 1994.

Selected Unrefereed Publications

- [14] Boyan, J. A. and W. L. Buntine, eds. "Statistical Machine Learning for Large-Scale Optimization." *Neural Computing Surveys* 3, 2000.
- [15] Boyan, J. A. "Learning Evaluation Functions for Global Optimization." Ph.D. thesis, Carnegie Mellon University, August 1998.
- [16] Boyan, J. A., A. W. Moore, and R. S. Sutton, Editors. "Proceedings of the Workshop on Value Function Approximation, Machine Learning Conference 1995." Carnegie Mellon Technical Report CMU-CS-95-206.