Jeff Schneider

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Research Interests

My research is in machine learning, artificial intelligence, optimization, reinforcement learning, data mining, robotics, sensing, and sensor networks. My efforts are focused on the use of these methods across science, government, and commercial applications.

Education

Ph.D. (Computer Science), **University of Rochester**, December 1994.
   Thesis title: "Intelligent Experimentation for Robot Skill Learning"
   Thesis advisor: Christopher M. Brown.

M.S. (Computer Science, EE minor), **Michigan State University**, June 1990.

B.S. (Computer Science, EE minor), **Michigan State University**, June 1988.

Employment

7/13-present   Research Professor, **Carnegie Mellon, Robotics Institute**, Pittsburgh, PA

2/15-9/18   Sr. Engineering Manager, **Uber Advanced Technologies Group**, Pittsburgh, PA

   ATG develops Uber's self-driving cars. Built and led teams developing machine learning and data science based approaches to autonomy onboard and offboard the vehicles.

7/04-6/13   Associate Research Professor, **Carnegie Mellon, Robotics Institute**, Pittsburgh, PA

8/04-7/06   Chief Informatics Officer, **Psychogenics, Inc.**, Tarrytown, NY

   PGI focuses on in vivo CNS drug discovery. Responsibilities included assembling the informatics group and leading the development of new machine learning based drug discovery methods.

7/98-7/04   Research Scientist, **Carnegie Mellon, Robotics Institute**, Pittsburgh, PA

8/95-4/04   Co-founder, CEO, **Schenley Park Research, Inc.**, Pittsburgh, PA

   SPR's mission is to bring machine learning technology to the commercial world by integrating it into software that is usable by non-experts. Activities include development of a general machine learning software product, development of a factory production scheduling system used by a major US food manufacturer, consulting for large and small clients, management of company finances, and employees. SPR had over two dozen clients in six countries including four Fortune 500 companies.

1/95-6/98	Post-Doc, **Carnegie Mellon, Robotics Institute**, Pittsburgh, PA Supervisor: Andrew W. Moore
1/91-12/94	Research Assistant, **U. of Rochester Comp. Sci. Dept.**, Rochester, NY Supervisor: Christopher M. Brown
5/93-7/93	Visiting Graduate Student, **MIT AI Lab**, Cambridge, MA Supervisor: Christopher G. Atkeson
6/91-9/91, 6/90-9/90, 6/89-9/89	Research Assistant, **General Motors Research Labs**, Warren, MI Supervisors: Yong Lee, Paul Besl
6/88-9/88, 6/87-9/87,	Research Assistant, **Texas Instruments AI Lab**, Plano, TX Supervisors: Tom Barrett, Pam Fales

Publications

Book Chapters

D. Neill, G. Cooper, K. Das, X. Jiang, J. Schneider, "Bayesian Network Scan Statistics for Multivariate Pattern Detection", *in J. Glaz, V. Pozdnyakov, S. Wallenstein, editors, "Scan Statistics – Methods and Applications"*, Birkhauser, 2008.

M. Riedmiller, A. Moore, J. Schneider, "Reinforcement Learning for Cooperating and Communicating Reactive Agents in Electrical Power Grids", *in M. Hannebauer, J. Wendler, E. Pagello, editors, "Balancing Reactivity and Social Deliberation in Multi-Agent Systems, Lecture Notes in Artificial Intelligence"*, Springer, 2002.

Refereed Publications

K. Kandasamy, W. Neiswanger, J. Schneider, B. Poczos, E. Xing, "Neural Architecture Search with Bayesian Optimisation and Optimal Transport", *Advances in Neural Information Processing Systems (NIPS)*, 2018.

J. Oliva, A. Dubey, M. Zaheer, B.Pczos, R. Salakhutdinov, E. Xing, J. Schneider, "Transformation Autoregressive Networks", *International Conference on Machine Learning (ICML)*, 2018.

K Kandasamy, A Krishnamurthy, J Schneider, B Poczos, "Asynchronous parallel Bayesian optimisation via thompson sampling", *AISTATS*, 2018.

K. Kandasamy, G. Dasarathy, J. Schneider, B. Poczos, "Multi-fidelity Bayesian Optimisation with Continuous Approximations", *International Conference on Machine Learning (ICML)*, 2017

S. Ravanbaksh, J. Schneider, B. Poczos, "Equivariance Through Parameter-Sharing", *International Conference on Machine Learning (ICML)*, 2017.

J. Oliva, B. Poczos, J. Schneider,"The Statistical Recurrent Unit", *International Conference on Machine Learning (ICML)*, 2017.

R. Garnett, S. Ho, S. Bird, J. Schneider, "Detecting damped Ly alpha absorbers with Gaussian processes", *Monthly Notices of the Royal Astronomical Society (MNRAS)*, 472 (2), 1850-1865, 2017.

K. Kandasamy, J. Schneider, B. Poczos, "Query Efficient Posterior Estimation in Scientific Experiments via Bayesian Active Learning", *Artificial Intelligence Journal (AIJ)*, 2017.

S. Ravanbakhsh, F. Lanusse, R. Mandelbaum, J. Schneider, B. Poczos, "Enabling Dark Energy Science with Deep Generative Models of Galaxy Images", *AAAI*, 2017.

Y. Ma, R. Garnett, J. Schneider, "Active Search for Sparse Signals with Region Sensing", *AAAI*, 2017.

M Ntampaka, H Trac, DJ Sutherland, S Fromenteau, B Pczos, J. Schneider, "Dynamical mass measurements of contaminated galaxy clusters using machine learning", *The Astrophysical Journal*, 831 (2), 135, 2016.

K. Kandasamy, G. Dasarathy, J. Oliva, J. Schneider, B. Poczos, "Gaussian Process Bandit Optimisation with Multi-fidelity Evaluations", *Advances in Neural Information Processing Systems (NIPS)*, 2016.

K. Kandasamy, G. Dasarathy, J. Schneider, B. Poczos, "The Multi-fidelity Multi-armed Bandit", *Advances in Neural Information Processing Systems (NIPS)*, 2016.

S. Ravanbakhsh, J. Oliva, S. Fromenteau, L. Price, S. Ho, J. Schneider, B. Pczos, "Estimating cosmological parameters from the dark matter distribution", *International Conference on Machine Learning (ICML)*, 2016.

J. Oliva, A. Dubey, A. Wilson, B. Poczos, J. Schneider, E. Xing, "Bayesian Nonparametric Kernel-Learning", *International Conference on AI and Statistics (AISTATS)*, 2016.

S. Ravanbakhsh, B. Poczos, J.Schneider, D. Schuurmans, R. Greiner, "Stochastic Neural Networks with Monotonic Activation Functions", *International Conference on Artificial Intelligence and Statistics(AISTATS)*, 2016.

C. Li, K. Kandasamy, B. Poczos, J. Schneider, "High Dimensional Bayesian Optimization via Restricted Projection Pursuit Models", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2016.

X. Wang, J. Oliva, J. Schneider, B. Pczos, "Nonparametric risk and stability analysis for multi-task learning problems", *International Joint Conference on Artificial Intelligence (IJCAI)*, 2016.

M. Ntampaka, H. Trac, D. Sutherland, N. Battaglia, B. Pczos, J. Schneider, "A machine learning approach for dynamical mass measurements of galaxy clusters", *The Astrophysical Journal*, 803 (2), 50, 2015.

R. Garnett, S. Ho, J. Schneider, "Finding galaxies in the shadows of quasars with Gaussian processes", *International Conference on Machine Learning (ICML)*, 2015.

K. Kandasamy, J. Schneider, B. Poczos, "High Dimensional Bayesian Optimisation and Bandits via Additive Models", *International Conference on Machine Learning (ICML)*, 2015.

D. Sutherland, J. Oliva, B. Poczos, J. Schneider, "Linear-Time Learning on Distributions with Approximate Kernel Embeddings", *AAAI*, 2015.

J. Oliva, W. Neiswanger, B. Poczos, E. Xing, J. Schneider, "Fast Function to Function Regression", *International Conference on AI and Statistics (AISTATS)*, 2015.

B. Boecking, M. Hall, J. Schneider, "Event prediction with learning algorithms - A study of events surrounding the Egyptian revolution of 2011 on the basis of micro blog data", *Policy and Internet*, 7 (2), 159-184, 2015.

K. Kandasamy, J. Schneider, B. Poczos, "Bayesian Active Learning for Posterior Estimation", (best paper) *International Joint Conference on Artificial Intelligence (IJCAI)*, 2015.

X. Wang, J. Schneider, "Generalization Bounds for Transfer Learning under Model Shift", *Uncertainty in Artificial Intelligence (UAI)*, 2015.

Y. Ma, T. Huang, J. Schneider, "Active Search and Bandits on Graphs using Sigma-Optimality", *Uncertainty in Artificial Intelligence (UAI)*, 2015.

D. Sutherland and J. Schneider, "On the Error of Random Fourier Features", *Uncertainty in Artificial Intelligence (UAI)*, 2015.

Y. Ma, D. Sutherland, R. Garnett, J. Schneider, "Active pointillistic pattern search", *Artificial Intelligence and Statistics (AISTATS)*, 672-680, 2015.

X. Wang, J. Schneider, "Flexible Transfer Learning under Support and Model Shift", *Neural Information Processing Systems (NIPS)*, 2014.

X. Wang, T. Huang, J. Schneider, "Active Transfer Learning under Model Shift", *International Conference on Machine Learning (ICML)*, 2014.

Y. Ma, R. Garnett, J. Schneider, "Active Area Search via Bayesian Quadrature", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2014.

J. Oliva, B. Poczos, T. Verstynen, A. Singh, J. Schneider, F. Yeh, W. Tseng, "FuSSO: Functional Shrinkage and Selection Operator", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2014.

J. Oliva, W. Neiswanger, B. Poczos, J. Schneider, E. Xing, "Fast Distribution To Real Regression", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2014.

X. Xu, S. Ho, H. Trac, J. Schneider, B. Poczos, M. Ntampaka, "A First Look at Creating Mock Catalogs with Machine Learning Techniques", *Astrophysical Journal*, 2013.

T. Huang, J. Schneider, "Learning Hidden Markov Models from Non-sequence Data via Tensor Decomposition", *Neural Information Processing Systems (NIPS)*, 2013.

Y. Ma, R. Garnett, J. Schneider, "Σ-Optimality for Active Learning on Gaussian Random Fields", *Neural Information Processing Systems (NIPS)*, 2013.

T. Huang, J. Schneider, "Spectral Learning of Hidden Markov Models from Dynamic and Static Data", *International Conference on Machine Learning (ICML)*, 2013.

J. Oliva, B. Poczos, J. Schneider, "Distribution to Distribution Regression", *International Conference on Machine Learning (ICML)*, 2013.

M. Tesch, J. Schneider, H. Choset, "Expensive Function Optimization with Stochastic Binary Outcomes", *International Conference on Machine Learning (ICML)*, 2013.

X. Wang, R. Garnett, J. Schneider, "Active Search on Graphs", *ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, 2013.

D. Sutherland, B. Poczos, J. Schneider, "Active Learning and Search on Low-Rank Matrices", *ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, 2013.

L. Xiong, B. Poczos, J. Schneider, "Efficient Learning on Point Sets", *IEEE International Conference on Data Mining (ICDM)*, 2013.

D. Brunner, V. Alexandrov, B. Caldarone, T. Hanania, D. Lowe, J. Schneider, J. Chandrasekhar,"Behavior-Based Screening as an Approach to Polypharmacological Ligands",*Polypharmacology in Drug Discovery*, pp 301-309, Wiley, 2012.

B. Poczos, Z. Ghahramani, J. Schneider, "Copula-based Kernel Dependency Measures", *International Conference on Machine Learning (ICML)*, 2012.

R. Garnett, Y. Krishnamurthy, X. Xiong, J. Schneider, R. Mann, "Bayesian Optimal Active Search and Surveying", *International Conference on Machine Learning (ICML)*, 2012.

Y. Zhang, J. Schneider, "Maximum Margin Output Coding", *International Conference on Machine Learning (ICML)*, 2012.

B. Poczos, J. Schneider, "Nonparametric Estimation of Conditional Information and Divergences", *AISTATS*, 2012.

Y. Zhang, J. Schneider, "A Composite Likelihood View for Multi-Label Classification", *AISTATS*, 2012.

B. Poczos, L. Xiong, D. Sutherland, J. Schneider, "Nonparametric Kernel Estimators for Image Classification", *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2012.

T. Huang, J. Schneider, "Learning Bi-clustered Vector Autoregressive Models", *European Conference on Machine Learning (ECML)*, 2012.

T. Huang, J. Schneider, "Learning Auto-regressive Models from Sequence and Non-sequence Data", *Neural Information Processing Systems (NIPS)*, 2011.

L. Xiong, B. Poczos, J. Schneider, "Group Anomaly Detection using Flexible Genre Models", *Neural Information Processing Systems (NIPS)*, 2011.

S. Daniel, A. Connolly, J. Schneider, J. VanderPlas, L. Xiong, "Classification of Stellar Spectra with Local Linear Embedding", *Astronomical Journal*, 142:203, 2011.

R. Garnett, Y. Krishnamurthy, D. Wang, J. Schneider, R. Mann, "Bayesian Optimal Active Search on Graphs", *KDD Workshop on Mining and Learning with Graphs*, 2011.

B. Poczos, L. Xiong, J. Schneider, "Nonparametric Divergence Estimation with Applications to Machine Learning on Distributions", *Uncertainty in Artificial Intelligence (UAI)*, 2011.

B. Poczos, J. Schneider, "On the Estimation of α-Divergences", *Artificial Intelligence and Statistics (AISTATS)*, 2011.

L. Xiong, B. Poczos, J. Schneider, A. Connolly, J. VanderPlas, "Hierarchical Probabilistic Models for Group Anomaly Detection", *Artificial Intelligence and Statistics (AISTATS)*, 2011.

Y. Zhang, J. Schneider, "Multi-Label Output Codes using Canonical Correlation Analysis", *Artificial Intelligence and Statistics (AISTATS)*, 2011.

M. Tesch, J. Schneider, H. Choset, "Adapting Control Policies for Expensive Systems to Changing Environments", *IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, 2011.

M. Tesch, J. Schneider, H. Choset, "Using Response Surfaces and Expected Improvement to Optimize Snake Robot Gait Parameters", *IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, 2011.

B. Poczos, Z. Szabo, J. Schneider, "Nonparametric Divergence Estimators for Independent Subspace Analysis", *European Signal Processing Conference (EUSIPCO)*, 2011.

L. Xiong, X. Chen, J. Schneider, "Direct Robust Matrix Factorization", *IEEE International Conference on Data Mining (ICDM)*, 2011.

Y. Zhang, J. Schneider, "Learning Multiple Tasks with a Sparse Matrix-Normal Penalty", *Neural Information Processing Systems (NIPS)*, 2010.

Y. Zhang, J. Schneider, "Projection Penalties: Dimension Reduction without Loss", *International Conference on Machine Learning (ICML)*, 2010.

T. Huang, J. Schneider, L. Song, "Learning Nonlinear Dynamic Models from Non-sequenced Data", *Proceedings of Artificial Intelligence and Statistics (AISTATS)*, 2010.

L. Xiong, X. Chen, T. Huang, J. Schneider, J. Carbonell, "Temporal Collaborative Filtering with Bayesian Probabilistic Tensor Factorization", *Proceedings of SIAM Data Mining (SDM)*, 2010.

Y. Zhang, J. Schneider, A. Dubrawski, "Learning Compressible Models", *Proceedings of SIAM Data Mining (SDM)*, 2010.

P. Donmez, J. Carbonell, J. Schneider, "A Probabilistic Framework to Learn from Multiple Annotators with Time-Varying Accuracy", *Proceedings of SIAM Data Mining (SDM)*, 2010.

T. Huang, J. Schneider, "Learning Linear Dynamical Systems without Sequence Information", *International Conference on Machine Learning (ICML)*, 2009.

P. Donmez, J. Carbonell, J. Schneider, "Efficiently Learning the Accuracy of Labeling Sources for Selective Sampling", *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, 2009.

Y. Zhang, J. Schneider, A. Dubrawski, "Learning the Semantic Correlation: An Alternative Way to Gain from Unlabeled Text", *Neural Information Processing Systems (NIPS)*, 2008.

K. Das, J. Schneider, D. Neill, "Anomaly Pattern Detection in Categorical Datasets", *14th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, 2008.

B. Bryan, J. Schneider, "Actively Learning Level-Sets of Composite Functions", *International Conference on Machine Learning (ICML)*, 2008.

R. Houghten, C. Pinilla, M Giulianotti, J. Appel, C. Dooley, A. Nefzi, J. Ostresh, Y. Yu, G. Maggiora, J. Medina-Franco, D. Brunner, J. Schneider, "Strategies for the Use of Mixture-Based Synthetic Combinatorial Libraries: Scaffold Ranking, Direct Testing In Vivo, and Enhanced Deconvolution by Computational Methods", *Journal of Combinatorial Chemistry*, 10 (1), 3-19, 2008.

B. Bryan, B. McMahan, C. Schafer, J. Schneider, "Efficiently Computing Minimax Expected-Size Confidence Regions", *International Conference on Machine Learning (ICML)*, 2007.

B. Bryan, J. Schneider, C. Miller, R. Nichol, C. Genovese, L. Wasserman, "Mapping the Cosmological Confidence Ball Surface", *Astrophysical Journal*, 2007.

K. Das, J. Schneider, "Detecting Anomalous Records in Categorical Data Sets", *ACM International Conference on Knowledge Discovery and Data Mining (KDD)*, 2007.

J. Roure, A. Dubrawski, J. Schneider, "A Study into Detection of Bio-Events in Multiple Streams of Surveillance Data", *Intelligence and Security Informatics: Biosurveillance*, pp 124-133, 2007.

B. Bryan, L. Wasserman, J. Schneider, R. Nichol, C. Miller, C. Genovese, "Active Learning for Identifying Function Threshold Boundaries," *Neural Information Processing Systems (NIPS)*, 2005.

R. Emery-Montemerlo, G. Gordon, J. Schneider, S. Thrun, "Game Theoretic Control for Robot Teams" *International Conference on Robotics and Automation*, 2005.

J. Schneider, D. Apfelbaum, D. Bagnell, R. Simmons, "Learning Opportunity Costs in Multi-Robot Market Based Planners," *International Conference on Robotics and Automation*, 2005.

P. Hsiung, A. Moore, D. Neill, J. Schneider, "Alias Detection in Link Data Sets", *International Conference on Intelligence Analysis*, 2005.

S. Baker, I. Matthews, J. Schneider, "Automatic Construction of Active Appearance Models as an Image Coding Problem", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, v. 26, no. 10, 2004.

K. Das, A. Moore, J. Schneider, "Belief state approaches to signaling alarms in surveillance systems", *ACM International Conference on Knowledge Discovery and Data Mining (KDD)*, 2004.

R. Emery-Montemerlo, G. Gordon, J. Schneider, S. Thrun, "Approximate Solutions for Partially Observable Stochastic Games with Common Payoffs", *Autonomous Agents and Multi-Agent Systems (AAMAS)*, 2004.

J. Bagnell, S. Kakade, A. Ng, J. Schneider, "Policy Search by Dynamic Programming", *Proceedings of Neural Information Processing Systems*, 2003.

A. Goldenberg, J. Kubica, P. Komarek, A. Moore, J. Schneider, "A Comparison of Statistical and Machine Learning Algorithms on the Task of Link Completion", *KDD Workshop on Link Analysis for Detecting Complex Behavior*, 2003.

J. Kubica, A. Moore, D. Cohn, J. Schneider, "Finding Underlying Connections: A Fast Method for Link Analysis and Collaboration Queries", *International Conference on Machine Learning (ICML)*, 2003.

J. Bagnell, J. Schneider, "Covariant Policy Search", *International Joint Conference on Artificial Intelligence*, 2003.

J. Kubica, A. Moore, J. Schneider, "Tractable Group Detection on Large Link Data Sets", *The Third IEEE International Conference on Data Mining*, 2003.

J. Schneider, A. Moore, "Active Learning in Discrete Input Spaces", *The 34th Interface Symposium*, Montreal, Quebec, Apr 17-20, 2002.

A. Moore, J. Schneider, "Real-valued All-Dimensions search: Low-overhead rapid searching over subsets of attributes", *Conference of Uncertainty in Artificial Intelligence (UAI)*, 2002.

J. Kubica, A. Moore, J. Schneider, Y. Yang, "Stochastic Link and Group Detection", *Eighteenth National Conference on Artificial Intelligence (AAAI)*, 2002.

C. Miller, C. Genovese, R. Nichol, L. Wasserman, A. Connolly, D. Reichart, A. Hopkins, J. Schneider, A. Moore,"Controlling the False Discovery Rate in Astrophysical Data Analysis", *Astronomical Journal*, 122, 6, 3492-3505, 2001.

Y. Liu, F. Dellaert, W.E. Rothfus, A. Moore, J. Schneider, T. Kanade, "Classification-Driven Pathological Neuroimage Retrieval Using Statistical Asymmetry Measures", *Proceedings of the International Conference of Medical Image Computing and Computer Assisted Intervention (MICCAI 2001)*, October 14-17, 2001.

J. A. Bagnell, J. Schneider, "Autonomous Helicopter Control using Reinforcement Learning Policy Search Methods", *International Conference on Robotics and Automation*, 2001.

J. G. Schneider, W. K. Wong, A. W. Moore, M. Riedmiller, "Distributed Value Functions", *International Conference on Machine Learning*, 1999.

M. Chen, T. Kanade, D. Pomerleau, J. Schneider, "3-Deformable Registration of Medical Images Using a Statistical Atlas", *Second International Conference on Medical Image Computing and Computer-Assisted Intervention*, 1999.

J. Schneider, J. Boyan, and A. Moore, "Stochastic Production Scheduling to meet Demand Forecasts", *IEEE Conference on Decision and Control*, 1998.

J. G. Schneider, J. A. Boyan, A. W. Moore, "Value Function Based Production Scheduling," *International Conference on Machine Learning*, 1998.

A. W. Moore, J. G. Schneider, J. A. Boyan, M. S. Lee, "Q2: Memory-based active learning for optimizing noisy continuous functions," *International Conference on Machine Learning*, 1998.

A. W. Moore, J. G. Schneider, K. Deng,"Efficient Locally Weighted Polynomial Regression Predictions," *International Conference on Machine Learning*, 1997.

J. G. Schneider,"Exploiting Model Uncertainty Estimates for Safe Dynamic Control Learning," *Neural Information Processing Systems (NIPS)*, 1996.

A. W. Moore, J. G. Schneider, "Memory-based Stochastic Optimization," *Neural Information Processing Systems (NIPS)*, 1995.

J. G. Schneider, C. M. Brown, "Cooperative Coaching in Robot Skill Learning," *Int. Conference on Intelligent Robots and Systems*, 1995.

J. G. Schneider, R. F. Gans, "Efficient Search for Robot Skill Learning: Simulation and Reality," *IEEE Int. Conference on Intelligent Robots and Systems*, 1994.

J. G. Schneider, C. M. Brown, "Task Level Training Signals for Learning Controllers," *IEEE International Symposium on Intelligent Control*, 1994.

J. G. Schneider, "High Dimension Action Spaces in Robot Skill Learning," *Twelfth National Conference on Artificial Intelligence (AAAI-94)*, 1994.

J. G. Schneider, C. M. Brown, "Cooperation and Coaching for Motor Skill Learning," *Int. Dedicated Conference on Robotics, Motion and Machine Vision*, 1994.

J. G. Schneider, C. M. Brown, "Robot Skill Learning, Basis Functions, and Control Regimes," *Proceedings: IEEE Int. Conference on Robotics and Automation*, 1993.

Other Publications and Posters

J. Oliva, B. Poczos, A. Singh, J. Schneider, T. Verstynen, "Sparse Functional Regression", *NIPS workshop on Modern Nonparametric Methods in Machine Learning*, 2013.

X. Wang, R. Garnett, J. Schneider, "An Impact Criterion for Active Graph Search", *NIPS workshop on Bayesian Optimization and Decision Making*, 2012.

B. Poczos, L. Xiong, J. Schneider, "Nonparametric Divergence Estimation for Machine Learning on Distributions", *The Learning Workshop (Snowbird)*, Ft. Lauderdale, FL, April 2011.

J. Schneider, J. Given, R. Le Bras, M. Fisseha, "Supervised Classification Methods for Seismic Phase Identification", *European Geosciences Union General Assembly*, Vienna, Austria, May 2010.

Y. Liu, N. Lazar, W. Rothfus, F. Dellaert, A. Moore, J. Schneider, T. Kanade,"Semantic based Biomedical Image Indexing and Retrieval",in *Trends and Advances in Content-Based Image and Video Retrieval*, 2004.

J. Kubica, A. Moore, D. Cohn, J. Schneider,"cGraph: A Fast Graph-Based Method for Link Analysis and Queries",*Proceedings of the 2003 IJCAI Text-Mining and Link-Analysis Workshop*, 2003.

A. Goldenberg, J. Kubica, P. Komarek, A. Moore, J. Schneider,"A Comparison of Statistical and Machine Learning Algorithms on the Task of Link Completion", *KDD Workshop on Link Analysis for Detecting Complex Behavior*, 2003.

A. Arora, V. Choudhary, K. Kannan, R. Krishnan, R. Padman and J. Schneider, "Value of Information in a Software Agent Marketplace", *Infonomics/Merit Workshop on Digitisation of Commerce: e-Intermediation*, Maastricht, November 23-24, 2001.

J. G. Schneider, "Open Loop Motor Skill Learning," In *Working notes, AAAI Fall Symposium: Machine Learning in Computer Vision*, K. Bowyer, L. Hall editors, 1993.

Invited Talks, Tutorials, and Panels

"Self Driving Cars and AI: Transforming Our Cities and Our Lives", *IEEE International Conference on Intelligent Transportation Systems*, Maui, Hawaii, Nov 5, 2018.

"Self Driving Cars and AI", *NITRD Workshop: The Convergence of High Performance Computing, Big Data, and Machine Learning*, Bethesda, MD, Oct 29-30, 2018.

"Panel on Industry and Robotics Research" ,*Robotics Science and Systems*, Pittsburgh, PA, Jun 26, 2018.

"Concept to Pavement: Launching a Self-Driving Product", *SXSW*, Austin, TX, Mar 11, 2018.

"Self-Driving Cars and AI: Transforming our Cities and our Lives", *Princeton Plasma Physics Lab Science on Saturday*, Princeton, NJ, Feb 17, 2018.

"Self Driving Cars and AI", *Auto.AI*, San Francisco, CA, Feb 28, 2018.

"Self Driving Cars and AI", *AI Frontiers*, Santa Clara, CA, Nov 5, 2017.

"Machine Learning for Controlling Complex Dynamic Systems", *Princeton Plasma Physics Colloquium*, Princeton, NJ, Nov 1, 2017.

"Machine Learning for Autonomous Vehicles", *ICML Tutorial*, Sydney, Australia, Aug 6, 2017.

"Computer Vision and Machine Learning Will Transform the Way We Move", *LDV Vision Summit*, New York, NY, May 24, 2017.

"How Self-Driving Cars Will Transform Our Cities and Our Lives", *TEDxCMU*, Pittsburgh, PA, Apr 1, 2017.

"Active Optimization and Self Driving Cars", *International Conference on Autonomous Agents and Multiagent Systems*, Sao Paulo, Brazil, May 8, 2017.

"Active Optimization and Self-Driving Cars", *National Academy of Science: Frontiers of Machine Learning*, Washington, D.C., Feb 1, 2017.

"Panel on AI", *AI X Prize*, Pittsburgh, PA, Nov 17, 2016.

"Bayesian Optimization and Embedded Learning Systems", *KDD Applied Data Science Invited Talk*, San Francisco, CA, Aug 15, 2016.

"Moving from Anomalies to Known Phenomena", *KDD Workshop on Outlier Definition, Detection, and Description on Demand*, San Francisco, CA, Aug 14, 2016.

"How machine learning helps Uber keep the disruptions coming", *Structure Data*, San Francisco, CA, Mar 9, 2016.

"Bayesian Optimization for Embedded Learning Systems", *NIPS Workshop on Bayesian Optmization: Flexibility and Scalability*, Dec 12, 2015.

"Bayesian Optimization for Embedded Learning Systems", *AAAI Fall Symposium on Embedded Learning Systems*, Washington, D.C., Nov 12, 2015.

"Machine learning algorithms I wish we had in hardware", *ICCAD HALO workshop*, Austin, TX, Nov 5, 2015.

"Machine Learning for Decision Making in the Era of Big Data", Amazon, Seattle, Feb 24, 2014.

"Robot snakes, sensor networks, and cosmology: How machine learning is changing the world", KSRI Speaker Series, Karlsruhe Institute of Technology, Germany, May 29, 2013.

"Learning Dynamic Models with Non-sequenced Data", UT Austin Data Mining Seminar Series, Austin, TX, Oct 28, 2011.

"Machine Learning Tutorials", Emerson Process Management, Pittsburgh, PA, June 8-17, 2010.

"Machine Learning Methods for Phase Classification in Seismology", *European Seismology Commission, 32nd General Assembly*, Montpellier, France, Sep 6-10, 2010.

"Finding Groups of Anomalies in Large Data Sets", *DOE Applied Mathematics Program Meeting*, Berkeley, CA, May 5, 2010.

"Anomaly Detection", *Pucon Symposium 2009: Advanced Mathematical Tools for Frontier Astronomy*, Pucon, Chile, Aug 6-8, 2009.

"Active Learning for Fitting Simulation Models to Observational Data", *IJCAI workshop on Machine Learning and AI Applications in Astrophysics and Cosmology*, Pasadena, CA, July 16-17, 2009.

"Data Mining Background", *International Atomic Energy Agency workshop on Data Mining and Data Fusion*, Vienna, Austria, September 15, 2008.

"Machine Learning in in vivo Drug Discovery", *ICML workshop on Machine Learning in Health Care*, Helsinki, Finland, July 9, 2008.

"Machine Learning in in vivo Drug Discovery", *University of Illinois Chicago Department of Medicinal Chemistry and Pharmacognosy*, Chicago, IL, April 3, 2008.

"Machine Learning in in vivo Drug Discovery", *IT University of Copenhagen*, Copenhagen, Denmark, February 29, 2008.

"Machine Learning in in vivo Drug Discovery", *Institute for Operations Research and the Management Sciences (INFORMS)*, Pittsburgh, PA, Nov 6, 2006.

"Machine Learning in in vivo Drug Discovery", *University of Pittsburgh Department of Biomedical Informatics Colloquium*, Pittsburgh, PA, September 22, 2006.

"Machine Learning in in vivo Drug Discovery", *IBM T.J. Watson Research Center*, Yorktown, NY, June 14, 2006.

"Data Mining in Anti-Terrorism Applications", *SAMSI Kickoff Workshop for the program on Data Mining and Machine Learning*, Research Triangle, NC, Sep 7-9, 2003.

"Link Detection and Searching for Terrorist Threat Activity", *IJCAI Text Mining and Link Analysis Workshop*, Acapulco, Mexio, August 9, 2003.

"Statistical Data Mining Methods for Detecting Terrorist Attacks", *DARPA Workshop on Smart Systems for Recognizing Radiation Threats*, Arlington, VA, May 28-29, 2003.

"Algorithms in Data Mining with Remote Sensing Applications", *ASPRS 2003 Annual Conference*, Anchorage, Alaska, May 5-9, 2003.

Invited member of panel on "Homeland Security Technologies: What are they and why do states need them?", National Association of State Chief Information Officers (NASCIO) Midyear Conference, Pittsburgh, April 6-8, 2003.

"Safe Learning Control for Nonlinear Dynamic Systems", *NTU-CMU joint symposium on Advances in Robotics*, Nanyang Technological University, Singapore, Aug 24, 2001.

"Data Mining Tutorial", National Security Agency, Columbia, MD, May 21, 2001.

"Tree Codes and Clustering Algorithms", *National Virtual Observatory Conference*, Caltech, Pasadena, CA, June 13–16, 2000.

"Reinforcement Learning for the Real World", Polish Academy of Sciences, Warsaw, Poland, January 5, 2000.

J. Schneider, A. Dubrawski, "Tutorial: Data Mining for Industrial Applications", Masterfoods, Warsaw, Poland, January 5-7, 2000.

"Exploiting Model Uncertainty Estimates for Safe Dynamic Control Learning", *ICML-97 Workshop on Reinforcement Learning*, Nashville, Tennessee, July 9–12, 1997.

A. Moore, J. Schneider, "Tutorial: Data Mining Algorithms and Applications", FirstUSA, Wilmington, DE, September, 1996.

A. W. Moore, S. Schaal, J. G. Schneider, "Locally Weighted Learning: Algorithms and Applications for Robot and Process Control", AAAI-96 Tutorial, Portland, Oregon, August 4–8, 1996.

J. Schneider, "Experimentation for Process Optimization", AAAI Workshop on Artificial Intelligence and Manufacturing, Albuquerque, NM, June, 1996.

"Active Learning on Non-Stationary Functions," *AAAI Fall Symposium on Active Learning*, Boston, MA, November 10–12, 1995.

"An Architecture Based on Intelligent Experimentation," *Workshop on Architectures for Intelligent Control Systems* at the IEEE International Symposium on Intelligent Control, Columbus, OH, August 16-18, 1994.

"Using Cooperating Learning Controllers for Complex Tasks," *ZiF Conference on Integration of Elementary Functions into Complex Behavior* , Bielefeld, Germany, July 12–15, 1994.

"A PUMA goes to Spring Training: Learning through Trial and Error," presented at a meeting of the *Rochester chapter of the American Society of Mechanical Engineers*, Rochester, NY, March 24, 1994.

"Learning Closed Loop Motor Skills," *NIPS Workshop on Robot Learning in Continuous Domains*, Vail, CO, December 3, 1993.

Professional Activities

Grant review panels:

NSF IIS/III Small Panel	May 2014
DOE Early Career Research Program Panel Review	Feb 2014
DOE Early Career Research Program Panel Review	Feb 2013
NSF IIS/III Small Panel	Mar 2012
NSF FODAVA Panel	May 2011
DOE Early Career Research Program Panel Review	Jan 2011
NSF CAREER Graph Data Panel	Oct 2007.
NSF Review Panel for the Large Synoptic Survey Telescope (LSST) project	Sep 2007.
NASA Applied Information Systems Research Program	May 2003.
Research Grants Council of Hong Kong	Mar 2003.
National Science Foundation SBIR in Artificial Intelligence	Aug 2002.

Boards:

Editorial Board of Machine Learning Journal (2006-)
International Machine Learning Society (IMLS) Secretary (2009-2017)
Civic Science, Scientific Advisory Board (2009-)
Idelic, Advisory Board (2018-)
Department of Energy Smart Mobility Consortium, Executive Advisory Board (2018-)

Reviewed papers for:

Int. Conf. on Computer Vision	IEEE Conf. on Computer Vision and Pattern Recognition
IEEE Conf. on Advanced Robotics	IEEE Conf. on Robotics and Automation
Journal of AI Research	Conf. on Neural Information Processing Systems
Artificial Intelligence Journal	IEEE Trans. on Robotics and Automation
Int. Journal of Systems Science	IEEE Trans. on Sys. Man, and Cybernetics
Journal of Process Control	IEEE American Control Conference
AAAI National Conference	Int. Conference on Machine Learning
Int. Joint Conf. on Artificial Intelligence	Int. Journal of Robotics Research
Pure and Applied Geophysics	

Past and current PhD students:

Drew Bagnell	CMU RI	Graduated 2005
Rosemary Emery	CMU RI	Graduated 2005
Brent Bryan	CMU MLD	Graduated 2008
Kaustav Das	CMU MLD	Graduated 2009
Yi Zhang	CMU MLD	Graduated 2012
Tzu-Kuo Huang	CMU MLD	Graduated 2013
Liang Xiong	CMU MLD	Graduated 2013
Matt Tesch	CMU RI	Graduated 2013
Dougal Sutherland	CMU CS	Graduated 2016
Yifei Ma	CMU MLD	Graduated 2017
Xuezhi Wang	CMU CS	Graduated 2016
Junier Oliva	CMU MLD	Graduated 2018
Kirthevasan Kandasamy	CMU MLD	Graduated 2018
Robin Sabhnani	CMU MLD	
Ian Char	CMU MLD	
Theo Gervet	CMU MLD	