

## Tom M. Mitchell

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### Research Interests:

Computer science, machine learning, artificial intelligence, cognitive neuroscience, and societal impacts of technology. My research focuses on basic and applied problems in machine learning, and on understanding how the human brain reads and represents the meaning of language.

### Positions Held:

University Professor, Carnegie Mellon University, (2009-present)  
Department Head, Machine Learning Department, Carnegie Mellon University, (2006-2016)  
E. Fredkin Professor, School of Computer Science, Carnegie Mellon University. (1999-present)  
Chief Scientist and Vice President, WhizBang! Labs. (2000-2001)  
Professor, Computer Science, Robotics, and Language Technologies, CMU. (1986-present)  
Assistant/Associate Professor, Department of Computer Science, Rutgers University. (1978-86)

### Education:

Ph.D. Stanford University, Electrical Engineering, Computer Science minor. April, 1979.  
M.S. Stanford University, Electrical Engineering. May 1975.  
S.B. Massachusetts Institute of Technology, Electrical Engineering. June, 1973.

### Honors and Awards:

2018 President's Medal, Stevens Institute of Technology  
2017 Brain Informatics Conference, 10-Year Outstanding Research Contributions Award  
2016 Elected to American Academy of Arts and Sciences  
2015 Honorary Doctor of Laws degree, Dalhousie University  
2010 Elected to National Academy of Engineering  
2008 Elected Fellow of American Association for the Advancement of Science (AAAS)  
2008 10-Year Best Paper Award at ICML/COLT.  
2007 Distinguished Service Award, Association for Advancement of Artificial Intelligence  
2003 Best Foundational Paper Award, American Medical Informatics Association (AMIA)  
2002 Peter Debye Prize, Edmund Hustinx Foundation, University of Maastricht  
1990 Elected Fellow of Association for the Advancement of Artificial Intelligence (AAAI)  
1984 NSF Presidential Young Investigator Award.  
1984 Best Paper Award, 21st IEEE Design Automation Conference.  
1983 IJCAI Computers and Thought Award.

## Professional Activities:

Testimony to United States House of Representatives Member Roundtable on Automation and the Future of Work: Policy Responses, July 2018.

Member, Standing Committee of the 100 Year Study of Artificial Intelligence, Stanford University, 2015-2018.

Member, US Department of Justice OJP Science Advisory Board Subcommittee on National Institute of Justice. 2011-2013.

Testimony to United States House of Representatives Committee on Veterans' Affairs: use of artificial intelligence to improve benefits claims processing at the VA. January 2008.

Chair, American Association for the Advancement of Science, Section on Information, Computing, and Communication (2006-2007).

President, Association for the Advancement of Artificial Intelligence (AAAI) (2001-2003).

Member of National Research Council Computer Science and Telecommunications Board (1997-2006).

Chair, National Academy of Sciences Workshop on Information Fusion for Counter Terrorism, (June 2002).

Member of Editorial Board of *Journal of Machine Learning Research* (2001-2008).

Member of Editorial Board of *Cognitive Science* journal (2005-present).

Member of Editorial Board of *Journal of Artificial Intelligence Research* (1997-present).

Member of Editorial Board of *Artificial Intelligence* (1983-2008).

Co-founder and Associate Editor, *Machine Learning Journal*, Kluwer Academic Press, (1985-1989). Member of Editorial Board (1985-2001).

Co-founder of the International Conference on Machine Learning, and co-organizer of the first five annual conferences.

## Books:

*Machine Learning*, T.M. Mitchell, McGraw Hill, 1997.

*Mind Matters: A Tribute to Allen Newell*, D. Steier and T. Mitchell (eds.), Erlbaum, 1996.

*Recent Advances in Robot Learning*, J. Franklin, T. Mitchell, and S. Thrun (eds.), Kluwer Academic Publishers, 1996.

*Machine Learning: A Guide to Current Research*, Mitchell, Carbonell, and Michalski, (eds.), Kluwer Academic Publishers, 1986

*Machine Learning: An Artificial Intelligence Approach. Volume 2* Michalski, Carbonell, and Mitchell, (eds.), Morgan-Kaufman, 1986.

*Machine Learning: An Artificial Intelligence Approach*, Michalski, Carbonell, and Mitchell, (eds.), Tioga Press, 1983.

## Selected Publications – Journals and Conferences

- [Never-Ending Learning](#), Tom M. Mitchell, W. Cohen, E. Hruschka, P. Talukdar, B. Yang, J. Betteridge, A. Carlson, B. Dalvi, M. Gardner, B. Kisiel, J. Krishnamurthy, N. Lao, K. Mazaitis, T. Mohamed, N. Nakashole, E. Platanios, A. Ritter, M. Samadi, B. Settles, R. Wang, D. Wijaya, A. Gupta, X. Chen, A. Saparov, M. Greaves, J. Welling. *Communications of the ACM*, 61(5), pp. 103-115, May 2018
- [What Can Machine Learning Do? Workforce Implications](#), Erik Brynjolfsson and Tom M. Mitchell, *Science*, December 22, 2017 358:6370.
- [Estimating Accuracy from Unlabeled Data: A Probabilistic Approach](#). Emmanouil Platanios, Hoifung Poon, Eric Horvitz and Tom M. Mitchell, *Neural Information Processing Systems (NIPS) 2017*.
- [Track how Technology is Transforming Work](#), Tom M. Mitchell and Erik Brynjolfsson, *Nature*, April 20, 2017 544:290-292
- [A Joint Sequential and Relational Model for Frame-Semantic Parsing](#), Bishan Yang and Tom Mitchell. *Conference on Empirical Methods on Natural Language Processing (EMNLP)*, 2017.
- [Joint Concept Learning and Semantic Parsing from Natural Language Explanations](#), S. Srivastava, I. Labutov, T.M. Mitchell, *Conference on Empirical Methods on Natural Language Processing (EMNLP)*, 2017.
- [Parsing Natural Language Conversations with Contextual Cues](#), S. Srivastava, A. Azaria, T.M. Mitchell. *International Joint Conference on Artificial Intelligence* 2017.
- [Leveraging Knowledge Bases in LSTMs for Improving Machine Reading](#) Bishan Yang and Tom Mitchell. *Proceedings of the Association for Computational Linguistics (ACL)*, 2017.
- [Instructable Intelligent Personal Agent](#), A. Azaria, J. Krishnamurthy, T. M. Mitchell, In *National Conference on Artificial Intelligence (AAAI)*. 2016
- [Joint Extraction of Events and Entities within a Document Context](#), Bishan Yang and Tom Mitchell. *Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL)*, 2016.
- [Joint Extraction of Events and Entities within a Document Context](#), Bishan Yang and Tom Mitchell. *Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL)*, 2016.
- [Estimating Accuracy from Unlabeled Data: A Bayesian Approach](#), E. Platanios, A. Dubey, T. M. Mitchell, in *Proceedings of the International Conference on Machine Learning (ICML)*, 2016.
- [Translation Invariant Word Embeddings](#). M. Gardner, K. Huang, E. Papalexakis, X. Fu, P. Talukdar, C. Faloutsos, N. Sidiropoulos, T. Mitchell. In *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2015
- [A Compositional and Interpretable Semantic Space](#). A. Fyshe, L. Wehbe, P. Talukdar, B. Murphy, T. Mitchell In *Proceedings of the 2015 Conference of the North American Chapter of the*

*Association for Computational Linguistics: Human Language Technologies* (NAACL 2015).

- [Efficient and Expressive Knowledge Base Completion Using Subgraph Feature Extraction](#). M. Gardner, T. Mitchell. In *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2015.
- [A Knowledge-Intensive Model for Prepositional Phrase Attachment](#). N. Nakashole, T. Mitchell. In *Proceedings of the 53rd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2015.
- [Learning a Compositional Semantics for Freebase with an Open Predicate Vocabulary](#). Jayant Krishnamurthy and Tom M Mitchell. In *Transactions of the Association for Computational Linguistics*, Volume 3, 2015.
- [Weakly Supervised Extraction of Computer Security Events from Twitter](#). Alan Ritter, Evan Wright, William Casey and Tom M. Mitchell. In *Proceedings of the 24th International Conference on World Wide Web, (WWW)*, 2015.
- [Machine Learning: Trends, Perspectives, and Prospects](#). Michael I. Jordan and Tom M. Mitchell, *Science* 349, 255, 2015. DOI: 10.1126/science.aaa8415.
- [Never-Ending Learning](#). T. Mitchell, W. Cohen, E. Hruschka, P. Talukdar, J. Betteridge, A. Carlson, B. Dalvi, M. Gardner, B. Kisiel, J. Krishnamurthy, N. Lao, K. Mazaitis, T. Mohamed, N. Nakashole, E. Platanios, A. Ritter, M. Samadi, B. Settles, R. Wang, D. Wijaya, A. Gupta, X. Chen, A. Saparov, M. Greaves, J. Welling. *Proceedings of the Conference on Artificial Intelligence (AAAI)*, 2015.
- [AskWorld: Budget-Sensitive Query Evaluation for Knowledge-on-Demand](#). M. Samadi, P. Talukdar, M. Veloso, T. Mitchell. In International Joint Conference on Artificial Intelligence (IJCAI), 2015.
- [Identifying Autism from Neural Representations of Social Interactions: Neurocognitive Markers of Autism](#), Marcel A. Just, Vladimir L. Cherkassky, Augusto Buchweitz, Timothy A. Keller, Tom M. Mitchell, *PLOS One* DOI: 10.1371/journal.pone.0113879, December 2, 2014.
- [Simultaneously uncovering the patterns of brain regions involved in different story reading subprocesses](#). L. Wehbe, B. Murphy, P. Talukdar, A. Fyshe, A. Ramdas, T. Mitchell, *PLOS One*, DOI: 10.1371/journal.pone.0112575, November 26, 2014. 2014. ([supporting website](#)).
- [Aligning context-based statistical models of language with brain activity during reading](#). Leila Wehbe, Ashish Vaswani, Kevin Knight, Tom M. Mitchell, *Proceedings of the 2014 Conference on Empirical Methods in Natural Language Processing (EMNLP-2014)*, 2014.
- [Estimating Accuracy from Unlabeled Data](#). E. A. Platanios, A. Blum, T. Mitchell. In *Uncertainty in Artificial Intelligence 2014 (UAI-2014)*, 2014.
- [Joint Syntactic and Semantic Parsing with Combinatory Categorical Grammar](#) J. Krishnamurthy, T. Mitchell. In *Proceedings of the 52nd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2014.
- [Incorporating Vector Space Similarity in Random Walk Inference over Knowledge Bases](#). M. Gardner, P. Talukdar, J. Krishnamurthy and T.M. Mitchell. In *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP-2014)*, 2014.
- [Language-Aware Truth Assessment of Fact Candidates](#). N. Nakashole, T. Mitchell. In *Proceedings of the 52nd Annual Meeting of the Association for Computational Linguistics (ACL-2014)*, 2014.
- [Multivariate analysis of correlation between electrophysiological and hemodynamic responses during cognitive processing](#). J Kujala, G Sudre, J Vartiainen, M Liljeström, T Mitchell, R Salmelin

*NeuroImage* 92, 207-216, 2014.

- [Turbo-SMT: Accelerating Coupled Sparse Matrix-Tensor Factorizations by 200x](#), Evangelos Papalexakis, Tom Mitchell, Nicholas Sidiropoulos, Christos Faloutsos, Partha Pratim Talukdar, Brian Murphy, *SDM 2014*, Philadelphia, PA, USA, 2014.
- [Improving Learning and Inference in a Large Knowledge-base using Latent Syntactic Cues](#). Matt Gardner, Partha Pratim Talukdar, Bryan Kisiel, and Tom Mitchell. In *Proceedings of the 2013 Conference on Empirical Methods in Natural Language Processing (EMNLP 2013)*, 2013.
- [Vector Space Semantic Parsing: A Framework for Compositional Vector Space Models](#). Jayant Krishnamurthy and Tom M. Mitchell. in *Proceedings of the ACL 2013 Workshop on Continuous Vector Space Models and their Compositionality*, 2013.
- [Tracking Neural Coding of Perceptual and Semantic Features of Concrete Nouns](#), Gustavo Sudre, Dean Pomerleau, Mark Palatucci, Leila Wehbe, Alona Fyshe, Riitta Salmelin and Tom Mitchell, *NeuroImage*, 2012 Aug 1;62(1):451-63.
- [Selecting Corpus-Semantic Models for Neurolinguistic Decoding](#), Brian Murphy, Partha Talukdar and Tom Mitchell, *Proceedings of the First Joint Conference on Lexical and Computational Semantics (\*SEM)*, Pages 114-123, June 2012.
- [Hierarchical Latent Dictionaries for Models of Brain Activation](#), Alona Fyshe, Emily Fox, David Dunson and Tom Mitchell, International Conference on Artificial Intelligence and Statistics, 2012.
- [Acquiring Temporal Constraints between Relations](#). P.P. Talukdar, D.T. Wijaya and T.M. Mitchell. In *Proceedings of the Conference on Information and Knowledge Management (CIKM)*, 2012
- [Weakly Supervised Training of Semantic Parsers](#). J. Krishnamurthy and T.M. Mitchell. In *Proceedings of the 2012 Conference on Empirical Methods in Natural Language Processing and Computational Natural Language Learning (EMNLP-CoNLL)*, 2012.
- [Coupled Temporal Scoping of Relational Facts](#). P.P. Talukdar, D.T. Wijaya and T.M. Mitchell. In *Proceedings of the ACM International Conference on Web Search and Data Mining (WSDM)*, 2012.
- [Discovering Relations between Noun Categories](#). T. Mohamed, E.R. Hruschka Jr. and T.M. Mitchell. In *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2011.
- [Random Walk Inference and Learning in A Large Scale Knowledge Base](#). N. Lao, T.M. Mitchell, W.W. Cohen In *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2011.
- [Human Computation for Attribute and Attribute Value Acquisition](#), E. Law and B. Settles and A. Snook and H. Surana and L. von Ahn and T. Mitchell. *CVPR Workshop on Fine-Grained Visual Categorization*, 2011
- [Which Noun Phrases Denote Which Concepts?](#). J. Krishnamurthy, T.M. Mitchell. In *Proceedings of the 49th Annual Meeting of the Association for Computational Linguistics (ACL)*, 2011.
- [Toward an Architecture for Never-Ending Language Learning](#). A. Carlson, J. Betteridge, B. Kisiel, B. Settles, E.R. Hruschka Jr. and T.M. Mitchell. In *Proceedings of the Conference on Artificial Intelligence (AAAI)*, 2010.
- [Learning to Tag From Open Vocabulary Labels](#), E. Law, B. Settles and T. Mitchell, *ECML*, 2010.
- [A Neurosemantic Theory of Concrete Noun Representation Based on the Underlying Brain Codes](#), Marcel A. Just, Vladimir L. Cherkassky, Sandesh Aryal, Tom M. Mitchell, *PLoS ONE* 5(1): e8622 DOI: 10.1371/journal.pone.0008622, January 13, 2010.

- [Coupled Semi-Supervised Learning for Information Extraction](#), Andrew Carlson, Justin Betteridge, Richard C. Wang, Estevam R. Hruschka Jr. and Tom M. Mitchell, *Proceedings of the Third ACM International Conference on Web Search and Data Mining (WSDM)*, February, 2010.
- [Mining Our Reality](#), Tom M. Mitchell, Perspective, *Science*, **326**, December 2009. DOI:10.1126/science.1174459
- [Populating the Semantic Web by Macro-Reading Internet Text](#), Tom M. Mitchell, Justin Betteridge, Andrew Carlson, Estevam Hruschka, and Richard Wang, Invited paper, *Proceedings of the 8th International Semantic Web Conference (ISWC 2009)*, October 2009.
- [Zero-Shot Learning with Semantic Output Codes](#), M. Palatucci, D. Pomerleau, G. Hinton, T. Mitchell *Neural Information Processing Systems (NIPS)*, 2009.
- [Integrating Multiple-Study Multiple-Subject fMRI Datasets Using Canonical Correlation Analysis](#), I. Rustandi, M.A. Just, T.M. Mitchell. *Proceedings of the MICCAI 2009 Workshop: Statistical modeling and detection issues in intra- and inter-subject functional MRI data analysis*. September 2009.
- [Modeling fMRI data generated by overlapping cognitive processes with unknown onsets using Hidden Process Models](#), R.A. Hutchinson, R.S. Niculescu, T.A. Keller, I. Rustandi, T.M. Mitchell, *NeuroImage* (2009), doi: 10.1016/j.neuroimage.2009.01.025.
- [Coupling Semi-Supervised Learning of Categories and Relations](#), Andrew Carlson, Justin Betteridge, Estevam R. Hruschka Jr. and Tom M. Mitchell, *Proceedings of the NAACL HLT 2009 Workshop on Semi-supervised Learning for Natural Language Processing*, June 2009.
- Machine learning classifiers and fMRI: a tutorial overview, Pereira F., Mitchell T., Botvinick M., *NeuroImage*, Volume 45, Issue 1, Pages S199-S209, March 2009.
- [Computational Models of Neural Representations in the Human Brain](#), (extended abstract) T.M. Mitchell, *DS 2008, Lecture Notes in Artificial Intelligence 5255*, J.-F. Boulicaut, M.R. Berthold, and T. Horvarth (Eds.), Springer-Verlag Berlin Heidelberg, pp. 26–27, 2008.
- [Predicting Human Brain Activity Associated with the Meanings of Nouns](#), T. M. Mitchell, S. V. Shinkareva, A. Carlson, K.M. Chang, V. L. Malave, R. A. Mason, and M. A. Just, *Science*, **320**, 1191, May 30, 2008. DOI: 10.1126/science.1152876. [Supporting Online Material](#). [Supporting website](#).
- [Using fMRI Brain Activation to Identify Cognitive States Associated with Perception of Tools and Dwellings](#), S.V. Shinkareva, R.A. Mason, V.L. Malave, W. Wang, T. M. Mitchell, and M. A. Just, *PLoS ONE* 3(1): e1394. doi:10.1371/journal.pone.0001394, January 2, 2008.
- [Exploring Hierarchical User Feedback in Email Clustering](#); Yifen Huang and Tom Mitchell. Enhanced Messaging Workshop, AAAI 2008, Chicago, IL, July 2008
- [Discovering a Semantic Basis of Neural Activity Using Simultaneous Sparse Approximation](#), M. Palatucci, T.M. Mitchell, and H. Liu International Conference on Machine Learning (ICML)-Sparse Optimization and Variable Selection Workshop, 2008.
- [A Combined Expression-Interaction Model for Inferring the Temporal Activity of Transcription Factors](#), Y. Shi, I. Simon, T. Mitchell and Z. Bar-Joseph, *Proceedings of The 12th Annual International Conference on Research in Computational Molecular Biology (RECOMB)*, 2008 [Supporting website](#)
- [Inferring Gene Regulatory Relationships from Multiple Time Series Datasets](#) Y. Shi, T. Mitchell and Z. Bar-Joseph, *Bioinformatics*, 23(6), pp. 755-63, 2007 [Supporting website](#)
- [Continuous hidden process model for time series expression experiments](#), Y. Shi, M. Klustein, I. Simon, T. Mitchell, and Z. Bar-Joseph, *Bioinformatics (Proceedings of ISMB 2007)*, 23(13), pp



i459-i467, 2007 [Supporting website](#)

- [Feature Selection for Grasp Recognition from Optical Markers](#), L.Y. Chang, N. Pollard, T. Mitchell, and E.P. Xing, *Proceedings of the 2007 IEEE/RSJ Intl. Conference on Intelligent Robots and Systems (IROS 2007)*, pp. 2944-2950, October, 2007.
- [Classification in Very High Dimensional Problems with Handfuls of Examples](#), M. Palatucci and T. Mitchell, *Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD)*, Springer-Verlag, September, 2007
- [The Discipline of Machine Learning](#), T. M. Mitchell, Machine Learning Department technical report CMU-ML-06-108, Carnegie Mellon University, July 2006.
- [Extracting Knowledge about Users' Activities from Raw Workstation Contents](#), T. M. Mitchell, S. Wang, Y. Huang, A. Cheyer, *Proceedings of the 21st National Conference on Artificial Intelligence (AAAI-2006)*, July 2006.
- [Hidden Process Models](#), R. A. Hutchinson, T. M. Mitchell, and I. Rustandi, *Proceedings of the International Conference on Machine Learning*, Pittsburgh, PA, June 2006.
- [Text Clustering with Extended User Feedback](#), Y. Huang and T. Mitchell, *Proceedings of the ACM SIGIR Conference*, August, 2006.
- [Decoding of Semantic Category Information from Single Trial fMRI Activation in Response to Word Stimuli Using Searchlight Voxel Selection](#), F. Pereira, R. Mason, M. Just, T. Mitchell, N. Kriegeskorte, *12th Conference on Human Brain Mapping*, June, 2006.
- [Classifying cognitive states associated with reading single words and two-word sentences](#), Svetlana V. Shinkareva, Robert A. Mason, Vicente L. Malave, Tom M. Mitchell, Marcel A. Just. *12th Conference on Human Brain Mapping*, June, 2006.
- [Bayesian Network Learning with Parameter Constraints](#), R.S. Niculescu, T.M. Mitchell, R.B. Rao, *Journal of Machine Learning Research*, 7, pp. 1357–1383, July 2006.
- [Semi-Supervised Text Classification Using EM](#), K. Nigam, A. McCallum, and T. Mitchell, in *Semi-Supervised Learning*, Olivier Chapelle, Bernhard Schölkopf, and Alexander Zien (eds.), MIT Press, 2006.
- Exploring Predictive and Reproducible Modeling with the Single-Subject FIAC Data Set, X. Chen, F. Pereira, W. Lee, S. Strother, T. Mitchell, *Human Brain Mapping*, 2006.
- [Learning to Identify Overlapping and Hidden Cognitive Processes from fMRI Data](#), R. Hutchinson, T.M. Mitchell, I. Rustandi, *11th Conference on Human Brain Mapping*, June, 2005.
- Predicting Dire Outcomes of Patients with Community Acquired Pneumonia, G.F. Cooper, V. Abraham, C. F. Aliferis, J.M. Aronis, B. G. Buchanan, R. Caruana, M. J. Fine, J. E. Janosky, G. Livingston, T. Mitchell, S. Montik, and P. Spirtes, *Journal of Biomedical Informatics*, 38, 2005, pp. 347-366.
- [Detecting Significant Multidimensional Spatial Clusters](#), D. Neill, A. Moore, F. Pereira, T. Mitchell, *Neural Information Processing Systems 2004*, December 2004.
- [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.
- [Learning to Classify Email into Speech Acts](#), W. W. Cohen, V. R. Carvalho, T.M. Mitchell, *Empirical Methods in Natural Language Processing*, Barcelona, July 2004.
- [Inferring Ongoing Activities of Workstation Users by Clustering Email](#), Y. Huang, D. Govindaraju, T. M. Mitchell, V. R. Carvalho, W. W. Cohen, *First Conference on Email and Spam*,

Mountain View, CA, July 2004.

- [Training fMRI Classifiers to Detect Cognitive States across Multiple Human Subjects](#), X. Wang, R. Hutchinson, and T. M. Mitchell, *Neural Information Processing Systems 2003*. December 2003.
- [Classifying Instantaneous Cognitive States from fMRI Data](#), T. Mitchell, R. Hutchinson, M. Just, R.S. Niculescu, F. Pereira, X. Wang, *American Medical Informatics Association Symposium*, October 2003. (received Best Foundational Paper Award)
- [Active Learning with Multiple View Feature Sets](#), R. Jones, R. Ghani, T.M. Mitchell and E. Riloff, *ECML 2003 Workshop on Adaptive Text Extraction and Mining*, 2003.
- Distinguishing natural language processes on the basis of fMRI-measured brain activation, F. Pereira, M. Just, T. Mitchell, *PKDD 2001*, Freiburg, Germany, 2001.
- [Discovering test set regularities in relational domains](#), S. Slattery and T.M. Mitchell. *Proceedings of the 17th International Conference on Machine Learning (ICML-00)*, pp. 895-902, Morgan Kaufmann, 2000.
- Predicting Caesarean Section with Decision Trees, C. Simms, R. Caruana, M.J. Krohn, L. Meyn, T.M. Mitchell, R.B. Rao, and I. Schmeuking, *Annual Meeting of the Society of Fetal and Maternal Medicine*, February 2000
- [Machine Learning and Data Mining](#), T. Mitchell, *Communications of the ACM*, Vol. 42, No. 11, November 1999.
- [Learning to Construct Knowledge Bases from the World Wide Web](#), M. Craven, D. DiPasquo, D. Freitag, A. McCallum, T. Mitchell, K. Nigam, and S. Slattery, *Artificial Intelligence*, Elsevier, 1999.
- [Text Classification from Labeled and Unlabeled Documents using EM](#), K. Nigam, Andrew McCallum, Sebastian Thrun and Tom Mitchell. *Machine Learning*, Kluwer Academic Press, 1999.
- [The Role of Unlabeled Data in Supervised Learning](#), T. Mitchell, *Proceedings of the Sixth International Colloquium on Cognitive Science*, San Sebastian, Spain, 1999 (invited paper), subsequently published in *Language, Knowledge, and Representation*, J.M. Larrazabal and L. A. Perez Miranda (eds.), Kluwer Academic Publishers, 2004.
- [Combining Labeled and Unlabeled Data with Co-Training](#), A. Blum and T. Mitchell, *Proceedings of the 1998 Conference on Computational Learning Theory*, July 1998.
- [Improving Text Classification by Shrinkage in a Hierarchy of Classes](#), A. McCallum, R. Rosenfeld, T. Mitchell and A. Ng. *Proceedings of the 1998 International Conference on Machine Learning*. July 1998.
- [Learning to Extract Symbolic Knowledge from the World Wide Web](#), M. Craven, D. DiPasquo, D. Freitag, A. McCallum, T. Mitchell, K. Nigam, and S. Slattery, *Proceedings of the 1998 National Conference on Artificial Intelligence*, July 1998.
- Learning to Classify Text from Labeled and Unlabeled Documents, A. McCallum, K. Nigam, S. Thrun, and T. Mitchell, *Proceedings of the 1998 National Conference on Artificial Intelligence*, July 1998.
- Data Mining at CALD-CMU: Tools, Experiences and Research Directions C. Faloutsos, G. Gibson, T. Mitchell, A. Moore, S. Thrun, *First Federal Data Mining Symposium*, Washington, D.C., December 1997.
- Does Machine Learning Really Work?, T. Mitchell, Invited paper, *AI Magazine*, Vol. 18, Number 3, AAAI Press, Fall 1997, p.11-20.
- [WebWatcher: A Tour Guide for the World Wide Web](#), T. Joachims, D. Freitag, and T. Mitchell,



*Proceedings of the 1997 IJCAI*, August 1997.

- An Evaluation of Machine-Learning Methods for Predicting Pneumonia Mortality, G. Cooper, C. Aliferis, R. Ambrosino, J. Aronic, B. Buchanan, R. Caruana, M. Fine, C. Glymour, G. Gordon, B. Hanusa, J. Janosky, C. Meek, T. Mitchell, R. Richardson, and P. Spirtes, *Artificial Intelligence in Medicine*, 1997.
- Lifelong Robot Learning, S. Thrun and T.M. Mitchell, in *Robotics and Autonomous Systems*, 15, pp. 24-46, 1995.
- [Using the Future to Sort Out the Present: Rankprop and Multitask Learning for Medical Risk Analysis](#), R. Caruana, S. Baluja, and T. Mitchell, *Neural Information Processing 7*, December 1995.
- [Explanation Based Learning for Mobile Robot Perception](#), J. O'Sullivan, T. Mitchell, and S. Thrun, in *Symbolic Visual Learning*, Ikeuchi and Veloso (eds.), 1996.
- WebWatcher: A Learning Apprentice for the World Wide Web, R. Armstrong, D. Freitag, T. Joachims, and T. Mitchell, in 1995 AAAI Spring Symposium on Information Gathering from Heterogeneous, Distributed Environments, March 1995.
- [Learning One More Thing](#), S. Thrun and T.M. Mitchell, *Proceedings of IJCAI 1995*, Montreal, August, 1995.
- [Learning Analytically and Inductively](#), T. Mitchell and S. Thrun, in *Mind Matters: A Tribute to Allen Newell*, Steier and Mitchell (eds.), Erlbaum, 1995.
- [Experience With a Learning Personal Assistant](#), T.M. Mitchell, R. Caruana, D. Freitag, J. McDermott, and D. Zabowski, *Communications of the ACM*, Vol. 37, No. 7, pp. 81-91, July 1994.
- Explanation-Based Learning: A Comparison of Symbolic and Neural Network Approaches, T.M. Mitchell and S.B. Thrun, *Tenth International Conference on Machine Learning*, Amherst, MA, June 27-29, 1993.
- Office Automation Systems that are Programmed by their Users, S. Bocionek and T.M. Mitchell. *23rd Annual Conference of the German Association of Computer Science (Gesellschaft fur Informatik, GI)*, Dresden, Germany, September, 1993.
- [Explanation-Based Neural Network Learning for Robot Control](#), T.M. Mitchell and S.B. Thrun, *Advances in Neural Information Processing Systems 5*, Hanson, Cowan, and Giles (eds.), Morgan-Kaufmann Press, 1993, pp. 287-294.
- The Engineering Design Research Center of Carnegie Mellon University, G.H. Demes, S.J. Fenves, I.E. Grossmann, C.T. Hendrickson, T.M. Mitchell, F.B. Prinz, D.P. Siewiorek, E. Subramanian, S. Talukdar, A. Westerberg, *Proceedings of the IEEE*, Special Issue on Engineering Research Centers, Invited paper, Vol. 81, No. 1, pp. 10-24, January, 1993.
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- A Personal Learning Apprentice, Dent, L., Boticario, J., McDermott, J., Mitchell, T., and Zabowski, D., *1992 National Conference on AI*, July, 1992.
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