

# Timothy N. Rubin

Senior Data Scientist

Tim.Rubin@gmail.com

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## EDUCATION

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<b>Indiana University</b> Cognitive Computing Laboratory	Bloomington, IN 2012-Present
<b>University of California, Irvine</b> Ph.D., Psychology M.A., Psychology <b>Advisor:</b> Mark Steyvers	Irvine, CA 2012 2009
<b>Tufts University</b> B.S. Psychology, <i>Cum Laude</i> Minor in Cognitive Science	Medford, MA May 2004

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## RESEARCH AND PROFESSIONAL EXPERIENCE

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### SENIOR DATA SCIENTIST

<b>Change Healthcare</b> Emeryville, Ca	2018 – Present
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### DATA SCIENTIST / SENIOR DATA SCIENTIST

<b>SurveyMonkey</b> San Mateo, CA	2016 – 2018
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### POSTDOCTORAL FELLOW

<b>Cognitive Computing Laboratory</b> Faculty Researchers: Michael Jones	2013 – 2016
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### DATA CONSULTANT

<b>University of Washington</b> Consulting work for: David C. Atkins, Michele Bedard-Gilligan	2012-2013
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### GRADUATE RESEARCH WORK (FUNDED)

<b>Statistical Learning Methods for Clinical Psychology</b> Faculty Researchers: Mark Steyvers and David Atkins	2010 - 2012
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<b>Topic Models for Documents and Ontologies</b> Supervising Faculty: Mark Steyvers and Padhraic Smyth	2009 - 2010
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### GRADUATE RESEARCH LABORATORIES

<b>Memory and Decision Laboratory</b> <i>University of California, Irvine</i> Faculty Researchers: Mark Steyvers and Michael Lee	2008 - 2012
<b>Movement and Vision Laboratory</b> <i>University of California, Irvine</i> Faculty Researchers: Charles F. Chubb and Charles E. Wright	2006 - 2008

**Human Information Processing Laboratory**  
University of California, Irvine  
Faculty Researcher: George Sperling

2007 - 2008

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## **ADDITIONAL RESEARCH EXPERIENCE**

**Undergraduate Thesis Project. Tufts University**  
Supervising Faculty: Daniel C. Dennett and Phillip Holcomb

2003- 2004

**Research Internship: Marine Mammal Behavior and Cognition Laboratory**  
Faculty Researcher: Dr. Stan Kuczaj

Fall, 2004

**Research Internship: Kewalo Basin Marine Mammal Laboratory**

May-Dec, 2003

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## **RESEARCH GRANTS AWARDED**

**2014-2015:** "Building Statistical Language Processing Algorithms for the Automated Coding of Semi-Structured Interview Data in Clinical Schizophrenia." Indiana University Collaborative Research Grants fund (IUCRG). Funding acceptance rate: <20%. Role: Co-PI. (PI: Michael N. Jones). \$65,434

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## **PUBLICATIONS**

**Rubin, T.N.**, Kojeyo, O., Gorgolewski, K.J., Jones, M.N., Poldrack, R.A., Yarkoni, T. (2017) Decoding brain activity using a large-scale probabilistic functional-anatomical atlas of human cognition. *PLOS Computational Biology*.

Papanikolaou, Y., Foulds, J.R., **Rubin, T.N.**, Tsoumakas, G. (2017) Improving Gibbs Sampling Predictions on Unseen Data for Latent Dirichlet Allocation. *Journal of Machine Learning Research*.

**Rubin T.N.**, Koyejo, S., Jones, M.N. Yarkoni, T. (2016) Generalized Correspondence-LDA Models (GC-LDA) for Identifying Functional Regions in the Brain, *Neural Information Processing Systems (NIPS)*. Barcelona, Spain.

Gruenenfelder, T.M., Recchia, G., **Rubin, T.N.**, Jones, M.N. (2015) Graph-Theoretic Properties of Networks Based on Word Association Norms: Implications for Models of Lexical Semantic Memory, *Cognitive Science*.

**Rubin, T.N.**, Chambers, A., Smyth, P., Steyvers, M., (2012) Statistical Topic Models for Multi-Label Document Classification. *Machine Learning*, special issue on Learning from Multi-Label Data.

Atkins, D.C., **Rubin, T.N.**, Steyvers, M., Doeden, M., Baucom, B.R., & Christensen, A. (2012) Novel methods for modeling couple and family text data: An introduction to topic models. *Journal of Family Psychology*.

**Rubin T.N.**, Kievit-Kylar, B., Willits, J.A., Jones, M.N., (2014) Organizing the space and behavior of semantic models, *36th Annual Conference of the Cognitive Science Society*. Quebec, Canada.

**Rubin, T.N.**, Zeigenfuse, M.D., Steyvers, M., (2011) A Model of Concept Generalization and Feature Representation in Hierarchies, *33rd Annual Conference of the Cognitive Science Society*. (41% acceptance rate for talks).

**Rubin, T.N.**, Steyvers, M., (2009) A Topic Model For Movie Choices and Ratings, *9th International Conference on Cognitive Modeling – ICCM 2009*, Manchester, UK.

**Rubin, T.N.**, Lee, M.D., & Chubb, C.F. (2008) Hierarchical Bayesian modeling of individual differences in texture discrimination. *Proceedings of the 30th Annual Conference of the Cognitive Science Society*.

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## **INVITED TALKS**

"Mixture Models for Multi-label Classification and Hierarchical Category Representations". Center for Innovation and Creativity, University of Colorado, Boulder. May 22nd, 2013.

"Machine learning approaches to classification and prediction, and their relevance to cognitive science". *Cognitive lunch talk series*, Indiana University. Aug 22nd, 2012.

"Statistical Topic Models for Multi-Label Document Classification", *AI/ML Weekly Seminar*, Donald Bren School of Information and Computer Sciences, UC Irvine. Jan 24th, 2011.

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## CONFERENCE TALKS

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**Rubin T.N.**, Jones, M.N., Koyejo, O., Yarkoni, T., "Neurotopics: Unsupervised learning for discovering function regions of the brain". *45<sup>th</sup> Annual Meeting for the Society for Computers in Psychology – SCiP 2015*. Chicago, IL. Presented: November 19<sup>th</sup>, 2015.

Willits, J.A., **Rubin T.N.**, Jones, M.N., "If you want to know which semantic model is best, don't compare semantic models". *45<sup>th</sup> Annual Meeting for the Society for Computers in Psychology – SCiP 2015*. Chicago, IL. Presented: November 19<sup>th</sup>, 2015.

**Rubin T.N.**, Kievit-Kylar, B., Willits, J.A., Jones, M.N., "Organizing the space and behavior of semantic models". *36<sup>th</sup> Annual meeting of the Cognitive Science Society – CogSci 2014*. Quebec, Canada. Presented: July 26<sup>th</sup>, 2014.

**Rubin T.N.**, Willits, J.A., Kievit-Kylar, B., Jones, M.N., "An organizing framework for the comparison of semantic models". *47<sup>th</sup> Annual meeting of the Society For Mathematical Psychology – MathPsych 2014*. Quebec, Canada. Presented: July 21<sup>st</sup>, 2014.

**Rubin, T.N.**, Molnick J., Wilcox-O'Hearn L.A., Yarkoni, T., M.N. "Neurotopics: Learning the associations between linguistic features and regions of brain activation from a corpus of neuroimaging publications". *43<sup>rd</sup> Annual Meeting for the Society for Computers in Psychology – SCiP 2013*. Toronto, Canada. Presented: November 14<sup>th</sup>, 2013.

Willits, J., Kievit-Kylar, B., **Rubin, T.N.**, & Jones, M.N. (2013). "Semanticore.org: A web-based portal for semantic models and psycholinguistic data". *43<sup>rd</sup> Annual Meeting for the Society for Computers in Psychology – SCiP 2013*. Toronto, Canada. Presented: November 14<sup>th</sup>, 2013.

**Rubin, T.N.**, Zeigenfuse, M.D., Steyvers, M., "A Model of Generalization and Feature Representation Across Graph Hierarchies". *44<sup>th</sup> Annual Meeting of the Society for Mathematical Psychology – MathPsych 2011*. Boston, MA. Presented: July 17<sup>th</sup>, 2011.

**Rubin, TN**, Steyvers, M. "Probabilistic Modeling of Human Choices and Preferences using Ratings Data". *The 42<sup>nd</sup> Annual Meeting of the Society for Mathematical Psychology – MathPsych 2009*. Amsterdam, Netherlands. Presented: August 2<sup>nd</sup>, 2009.

**Rubin, TN**, Steyvers, M., "Modeling Movie Choices and Ratings". *The Institute for Mathematical Behavioral Sciences, Graduate Student Conference*. Irvine, CA. Presented: May 13<sup>th</sup>, 2009.

**Rubin, T.N.**, Chubb, C., Wright, C.E., Sperling, G. "Spatiotemporal Dynamics of the Perception of Dot Displays". University of California Irvine. *Department of Cognitive Sciences, Colloquium*. Irvine, CA. Presented: June 6<sup>th</sup>, 2008.

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## CONFERENCE POSTERS

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**Rubin, T.N.**, (2017) Modeling Survey Completion Rates and Completion Time using Large-scale Data. *AAPOR 2017*. New Orleans, LA. Presented: May 20<sup>th</sup>, 2017.

**Rubin T.N.**, Koyejo, S., Jones, M.N. Yarkoni, T, (2016) Generalized Correspondence-LDA Models (GC-LDA) for Identifying Functional Regions in the Brain, *30<sup>th</sup> Annual Conference on Neural Information Processing Systems (NIPS 2016)*. Barcelona, Spain. Presented: December 7<sup>th</sup>, 2016.

**Rubin T.N.**, Jones, M.N., Yarkoni, T. (2015) Large-scale functional mapping of brain activity using a joint spatial and semantic topic model, *OHBM 2015*. Honolulu, HI. Presented: June 18<sup>th</sup>, 2015.

**Rubin T.N.**, Jones, M.N., (2013) Accounting for the nature of human response selection in evaluating semantic models. *43<sup>rd</sup> Annual Meeting for the Society for Computers in Psychology – SCiP 2013*. Toronto, Canada. Presented: November 14<sup>th</sup>, 2013.

**Rubin T.N.**, Steyvers M., (2011) Modeling Category Generalization via Distributed Representations Across Graph Hierarchies, *First Southern California Machine Learning Workshop (SoCaML 2011)*. Irvine, CA. Presented: September 9<sup>th</sup>, 2011.

**Rubin T.N.**, Zeigenfuse M.D., Steyvers M., (2011) A Model of Concept Generalization and Feature Representation in Hierarchies, *33<sup>rd</sup> Annual Conference of the Cognitive Science Society*. Boston, MA. Presented: July, 22<sup>nd</sup>, 2011.

**Rubin T.N.**, Lee M.D., DeYoung M., Steyvers M., (2010) Wisdom of the Crowds Effects in Prediction of Future Outcomes; A case study using Fantasy Football Rankings, *43<sup>rd</sup> Annual Meeting of the Society for Mathematical Psychology (SMP 2010)*. Portland, OR. Presented: Sunday, August 8<sup>th</sup>, 2010.

**Rubin T.N.**, Holloway A., Smyth P., Steyvers M. (2009), Modeling Tag Dependencies in Tagged Documents. *Neural Information Processing Systems Conference; "Applications for Topic Models: Text and Beyond" Workshop*. Whistler, BC. Presented: December 11th, 2009.

**Rubin T.N.**, Steyvers, M., (2009) A Topic Model for Movie Choices and Ratings. *The 9th International Conference on Cognitive Modeling*. Manchester, UK. Presented: July 25th, 2009.

**Rubin, T.N.**, Lee, M.D., & Chubb, C.F. (2008). Hierarchical Bayesian modeling of individual differences in texture discrimination. *The 30th Annual Conference of the Cognitive Science Society*. Washington, DC. Presented: July 24th, 2008.

**Rubin T.N.**, Chubb CF, Wright C.E., Drew S.A., Sperling G. (2008) Visual Perception of Briefly Presented Dot Displays. *Joint Symposium on Neural Computation*. Irvine, CA. Presented: May 31st, 2008.

**Rubin T.N.**, Chubb C.F., Wright C.E., Drew SA, Sperling G. (2008) Spatiotemporal Dynamics of the Perception of Dot Displays. *Vision Sciences Society Meeting (VSS 2008)*. Naples, FL. Presented: May 10th, 2008.

Drew S.A., Chubb C.F., Erlich T., **Rubin T.N.**, Sperling G. (2008). Binary versus Graded Filters for Selectively Attending to Dots of Different Contrasts, *Vision Sciences Society Meeting*. Naples, FL. Presented: May 10th, 2008.

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## AWARDS, HONORS

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Social Sciences Summer Fellowship	2007-2011
Student Travel Award, <i>44th Annual Meeting of the Society for Mathematical Psychology</i>	2011
Student Travel Award, <i>43rd Annual Meeting of the Society for Mathematical Psychology</i>	2010
Student Travel Award, <i>42nd Annual Meeting of the Society for Mathematical Psychology</i>	2009
<i>Cum Laude</i> . B.S. Psychology, Tufts University.	2004
MacJannet Merit Scholarship, Tufts University.	2002
Dean's List, Tufts University.	1999-2004

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## RELEVANT SKILLS

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**Programming Languages:** Python, SQL, MATLAB, R,  $\text{\LaTeX}$ , BUGS, SPSS, Excel, Java, C/C++ (some), HTML (some).

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## PROFESSIONAL ACTIVITIES

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Ad-Hoc Reviewing, *AI Magazine* (Magazine)  
Ad-Hoc Reviewing, *Behavior Research Methods* (Journal)  
Ad-Hoc Reviewing, *Journal of Machine Learning Research* (Journal)  
Ad-Hoc Reviewing, *Psychological Review* (Journal)  
Ad-Hoc Reviewing, *Cognitive Science Society* (Conference)  
Ad-Hoc Reviewing, *International Conference on Machine Learning, ICML* (Conference)  
Ad-Hoc Reviewing, *Transactions on Multimedia Computing, Communications, and Applications* (Journal)  
Ad-Hoc Reviewing, *Mathematical Problems in Engineering* (Journal)

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## PROFESSIONAL AFFILIATIONS

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<b>Cognitive Science Society</b>	Student Member 2008-Present
<b>Society for Mathematical Psychology</b>	Student Member 2009-Present
<b>Vision Sciences Society</b>	Student Member 2007-2008
<b>Society for Neuroscience</b>	Student Member 2007-2008

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## RELEVANT COURSEWORK

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Psych. 200a      Discrete Math and Probability Theory

Psych. 200b	Introduction to Mathematical Statistics
Psych. 200c	Experimental Design
Psych. 205a	Computational and Research Methods Using Matlab
Psych. 205b	Experiments in Matlab
Psych. 237a	Bayesian Cognitive Modeling
Psych. 214	Advanced Cognitive Modeling
Psych. 234a	Mathematical Models of Cognitive Processes
Psych. 212	Learning, Memory and Knowledge Organization
Psych. 214	Decision Making and Problem Solving
Stats. 200 a	Intermediate Probability Theory
CompSci. 273a	Machine Learning
CompSci. 274a	Probabilistic Learning

### **ADDITIONAL PROGRAMS**

Graduate Summer School: Probabilistic Models of Cognition (IPAM 2011)

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### **TEACHING EXPERIENCE**

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TA, Psychology 114M	Matlab Programming	1 quarter
TA, Social Science 10B	Probability and Statistics	2 quarters
TA, Psychology 21A	Adolescent Psychology	2 quarters
TA, Psychology 191	Language and Brain	1 quarter
TA, Social Science 5D	US/World Geography	1 quarter
TA, Psychology 172AW	American Culture	1 quarter