

Timothy N. Rubin, PhD

Senior Data Scientist

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[Personal Website](#) | [Github Profile](#)

WORK AND RESEARCH EXPERIENCE

SENIOR DATA SCIENTIST: CHANGE HEALTHCARE:

2018-PRESENT

- Developing a framework for building, evaluating, and deploying machine learning pipelines
- Contributed to an in house active-learning solution for efficiently collecting and labeling text data
- Created tools for developing Named Entity Recognition models for extracting laboratory values from hospital records
- Developed production code for deploying NER models and leveraging them to evaluate insurance claims

SENIOR DATA SCIENTIST: SURVEYMONKEY

2016-2018

- Developed all algorithms underlying SurveyMonkey's [SurveyMonkey Genius](#) platform—a user-facing ML product that provides customers with predictions about their survey (e.g., estimated completion times) as well as personalized recommendations for how to improve their survey. SurveyMonkey Genius has received [industry press](#) as part of SurveyMonkey's 2017 company rebrand, and had significant financial and brand impact.
- Developed a new SurveyMonkey use-case ontology and automated classification model. Applications for this product include sales assistance and driving a variety of personalization opportunities for users.

RESEARCH SCIENTIST: INDIANA UNIVERSITY

2013 – 2016

- Led and collaborated on research projects leading to numerous publications in top-tier journals and conferences
- Developed and implemented novel algorithms for (a) automatically identifying functional brain regions using GC-LDA (b) empirically evaluating semantic models, and (c) improving prediction methods for Latent Dirichlet Allocation models
- Secured a \$65,000 grant for studying linguistic features related to schizophrenia

DATA SCIENCE CONSULTANT: UNIVERSITY OF WASHINGTON

2013

- Performed statistical analyses and hypothesis tests on previously collected mental health data
- Applied unsupervised learning algorithms for interpreting and summarizing a corpus of open-ended questionnaire responses collected in clinical settings

GRADUATE STUDENT RESEARCHER: UNIVERSITY OF CALIFORNIA, IRVINE

2006 - 2012

- Developed and implemented novel probabilistic topic models that achieved state-of-the-art performance on multi-labeled document classification (MATLAB and C)
- Developed and implemented a novel algorithm for movie recommendations using Netflix data (MATLAB)
- Teaching assistant for 8 semesters. Ran discussion and laboratory sections for undergraduate classes

RELEVANT SKILLS

Analytical Skills:

- Machine learning and pattern recognition; Natural language processing; Experimental design; Data mining; Research and data modeling; Probability theory and statistics

Programming languages:

- Python; SQL; Spark; Java (some); C++ (some)

Statistical analysis software:

- MATLAB; R; SPSS; Excel; BUGS

Communication Skills:

- Public speaking; Teaching; Writing and presentation of research, for both technical and non-technical audiences

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

EDUCATION

University of California, Irvine
Ph.D., Department of Cognitive Sciences
M.A., Department of Cognitive Sciences

Irvine, CA
2012
2009

Tufts University
B.S. Psychology, *Cum Laude*
Minor in Cognitive Science

Medford, MA
May 2004

SELECTED PUBLICATIONS

Papanikolaou, Y., **Rubin, T.N.**, Tsoumakas, G. (2017) [Dense Distributions from Sparse Samples: Improved Gibbs Sampling Parameter Estimators for LDA](#). *Journal of Machine Learning Research (JMLR)*.

Rubin, T.N., Koyejo, O., Jones, M.N., Yarkoni, Y., (2016). [Generalized Correspondence-LDA Models \(GC-LDA\) for Identifying Functional Regions in the Brain](#). *30th Annual Conference on Neural Information Processing Systems (NIPS)*.

Rubin, T.N., Koyejo, O., Gorgolewski, K.J., Jones, M.N., Poldrack, R.A., Yarkoni, T. (2016) [Decoding brain activity using a large-scale probabilistic functional-anatomical atlas of human cognition](#). *PLOS Computational Biology*.

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., 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*.

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*.

Rubin, T.N., Steyvers, M., (2009). [A Topic Model For Movie Choices and Ratings](#), *9th International Conference on Cognitive Modeling (ICCM)*, ([Supplementary Material](#))