

Sarah Tan

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OBJECTIVE Seeking post-graduation position in applied machine learning research / data science. My dissertation research is on interpretability, causal inference methods, and social good applications.

EDUCATION **Cornell University** **Expected May 2019**
PhD Statistics; Minor in Computer Science

- Advisors: Giles Hooker, Martin Wells (Cornell Statistics)
- Committee member: Thorsten Joachims (Cornell Computer Science)
- External committee member: Rich Caruana (Microsoft Research)
- Affiliation: Cornell Algorithms, Big Data, and Inequality Program

University of California San Francisco (UCSF) **Jan 2018 - present**
Visiting Graduate Student

- Host: Charles McCulloch (UCSF Epidemiology and Biostatistics)
- Ongoing Collaborations:
 - Memory and Aging Center: Deep learning on MRI images for dementia diagnosis
 - Zuckerberg San Francisco General Hospital: Probing the need and use cases for interpretability in clinical decision support systems

University of California Berkeley **2006 - 2010**
BA (Honors) Statistics, Economics; Minor in Operations Research

PROFESSIONAL EXPERIENCE **Microsoft Research** Redmond, WA
Research Intern Mentors: Rich Caruana, Kori Inkpen, Ece Kamar

Focus Areas: Interpretability, Algorithmic Fairness **Summers 2017 & 2018**

- Developed global interpretability method for fully-connected neural nets to characterize the relationship between tabular data features and neural net predictions.
- Extended model distillation techniques to inspect criminal justice and credit risk scoring models for potential bias.

Data Science for Social Good Chicago, IL
Summer Fellow Mentor: Rayid Ghani **Summer 2014**

- Developed predictive models to help a nonprofit identify clients at risk for attrition or noncompliance; wrote [blog post](#) to describe findings for non-technical audience.

Johnson Research Labs | Startup research lab New York, NY
Research Scientist. Focus Area: Computational Social Science **2012 – 2013**

- Applied topic modeling on tweets, news articles, and other media content to investigate the influence of social issue documentaries on public opinion and legislation.

New York City Health + Hospitals | Public hospitals system
Research Assistant (Part-Time), Statistics & Data Quality Group **Oct 2011 – Aug 2013**

- Pulled data from electronic medical records and applied statistical models to develop predictive models of care quality, hospital readmissions, and adverse drug reactions.

For my complete work experience, please see my [LinkedIn](#).

PUBLICATIONS **Tan**, R. Caruana, G Hooker, Y Lou. *Distill-and-Compare: Auditing Black-Box Models Using Transparent Model Distillation*, ACM/AAAI AI, Ethics, Society Conference (Oral talk), 2018.

- Media coverage: [MIT Technology Review](#), [Politico](#), [Futurism](#), [WorkFlow](#)

Tan, S Makela, D Heller, K Konty, S Balter, T Zheng, JH Stark. *Using Bayesian Evidence Synthesis to Estimate Disease Prevalence Among Hard-To-Reach Populations*, Epidemics, 2018.

- Presented to NYC Health Commissioner

Tan. *Interpretable Approaches to Detect Bias in Black-Box Models*. AAAI/ACM AIES 2018 Doctoral Consortium, 2018.

S Seto, Tan, G Hooker, M Wells. *A Double Parametric Bootstrap Test for Topic Models*, NIPS Interpretability Symposium, 2017.

Tan, G Hooker, MT Wells. *Tree Space Prototypes: Another Look at Making Tree Ensembles Interpretable*. NIPS Interpretability Workshop, 2016.

IB Vasi, E Walker, JS Johnson, Tan. *“No Fracking Way!” Media Activism, Discursive Opportunities and Local Opposition against Hydraulic Fracturing in the United States, 2010-2013*, American Sociological Review, 2015.

- **2 Best Paper Awards** from American Sociological Association
- Media coverage: [The Guardian](#), [The Atlantic](#), [Pacific Standard](#)

Tan, DI Miller, J Savage. *Proximity Score Matching: Locally Adaptive Matching for Causal Inference*, Atlantic Causal Inference Conference (Lightning talk), 2015.

- **1 of 3 Best Student Paper Awards** from American Statistical Association SSPA section

For all my publications, please see my [Google Scholar](#).

WORK
UNDER REVIEW

Tan, R Caruana, G Hooker, P Koch, A Gordo. *Learning Global Additive Explanations for Neural Nets Using Model Distillation*

Tan, J Adebayo, K Inkpen, E Kamar. *Investigating Human + Machine Complementarity for Recidivism Predictions*

X Zhang, Tan, P Koch, Y Lou, U Chajewska, R Caruana. *Interpretability is Harder in the Multiclass Setting: Axiomatic Interpretability for Multiclass Additive Models*

GRANTS AND
FELLOWSHIPS

- Microsoft Research Dissertation Grant (\$25,000) **2018**
- American Statistical Association Wray Jackson Smith Award (\$1,000) **2017**
- Engaged Cornell Grant for Community-Engaged Dissertation Research (\$15,000) **2017**
- Harmony Institute Research Fellowship (\$15,000) **2016**

INVITED
TALKS

- AT&T Labs Graduate Student Symposium **Nov 2018**
- UC Santa Cruz Responsible Data Science Seminar. *Host: Lise Getoor* **May 2018**
- Novartis Pharmaceuticals. *Host: Statistics Methodology Group* **April 2018**
- UCSF Medical Interpretability Seminar. *Host: Gilmer Valdes* **March 2018**

SERVICE

- *Co-Organizer*, ICLR Workshop “Debugging Machine Learning Models” **2019**
- *Executive Board Member*, Women in Machine Learning organization **2018 - present**
- *Co-Organizer*, Invited Session “New Advances in Causal Inference for Longitudinal and Survival Data” at International Conference on Health Policy Statistics (ICHPS) **2018**
- *Student Representative to Scientific Committee*, ICHPS **2018**
- *Co-Organizer*, Cornell University Machine Learning Discussion Group **2017**
- *Co-Organizer*, Women in Machine Learning Workshop (600 attendees, 200 posters) **2016**

PROGRAMMING

R, Python

SOFTWARE

R package [surfin](#): ([Statistical Inference for Random Forests](#))