

# Tong Wang

tong.wang.tw687@yale.edu  
tongwang-ai.github.io  
Google Scholar

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EMPLOYMENT	<b>Yale University, School of Management</b> Assistant Professor of Marketing	New Haven, CT 2023 - PRESENT
	<b>University of Iowa, Tippie College of Business</b> Assistant Professor of Business Analytics (promotion and tenure awarded in 2023)	Iowa City, IA 2016 - 2023
EDUCATION	<b>Massachusetts Institute of Technology</b> Ph.D. in Computer Science M.S. in Electrical Engineering and Computer Science	Cambridge, MA 2012 - 2016 2010 - 2012
	<b>Beijing University of Posts and Telecommunications</b> B.S. in Electrical Engineering with <i>Highest Distinction</i>	Beijing, China 2006 - 2010
RESEARCH OVERVIEW	I work on two types of research. 1) I develop new <b>interpretable machine learning</b> models that enable human understanding of the decision-making processes. 2) I use machine learning methods to solve business problems, understand phenomena, or discover insights.	
PUBLICATIONS	† student under my supervision * corresponding author + Equal Contribution	
PREPRINTS	<ol style="list-style-type: none"><li>Using Advanced LLMs to Enhance Smaller LLMs: An Interpretable Knowledge Distillation Approach <b>Tong Wang</b>, K. Sudhir and Dat Hong</li><li>Modeling Vendor Survival on Multi-Vendor Platforms: Insights and Interpretable Predictions for Restaurants in Shopping Malls Yingsi Huang, Lan Wang, <b>Tong Wang</b>, and Yu Jeffrey Hu</li><li>From Model Explanation to Data Misinterpretation: Uncovering the Pitfalls of Post Hoc Explainers in Business Research Ronilo Ragodos<sup>†</sup>, <b>Tong Wang</b><sup>*</sup>, Lu Feng, and Yu Jeffrey Hu</li><li>The Case for Value-Driven AI Advisors and a Framework for Producing Them [BA][SG] Nicholas Wolczynski, Maytal Saar-Tsechansky, <b>Tong Wang</b></li><li>ConProGAIL: Interpretable Policy Learning via Conceptual Prototyping for Human Spatiotemporal Decision Understanding Ronilo Ragodos, Xun Zhou, <b>Tong Wang</b>, and Jun Luo</li><li>Personalized Path Recourse Dat Hong, <b>Tong Wang</b><sup>*</sup></li><li>Optimized Rule Sets M. Cristina Molero Del Rio, Boxuan Li, <b>Tong Wang</b>, and Cynthia Rudin</li><li>Augmented Fairness: An Interpretable Model Augmenting Decision-Makers' Fairness <b>Tong Wang</b>, Maytal Saar-Tsechansky Best Paper Award at 2020 INFORMS Workshop on Data Science</li></ol>	

- [C1]. Improving Decision Sparsity  
Yiyang Sun, **Tong Wang**, and Cynthia Rudin  
*NeurIPS – Conference on Neural Information Processing Systems*, 2024
- [C2]. Sparse and Faithful Explanations Without Sparse Models [\[SG\]](#)  
Zhi Chen, Yiyang Sun, Vittorio Orland, **Tong Wang**, and Cynthia Rudin  
*AISTATS - Artificial Intelligence and Statistics Conference*, 2024  
**Winner of INFORMS 2023 Data Mining Best Paper Award General Track**
- [J1]. Interpretable Text Classification Via Prototype Trajectory  
Dat Hong<sup>†</sup>, **Tong Wang\***, Stephen Baek  
*JMLR – Journal of Machine Learning Research*, 2023
- [C3]. ProtoX – Explaining a Reinforcement Learning Agent via Prototyping  
Ronilo Ragodos<sup>†</sup>, **Tong Wang\***, Qihang Lin, Xun Zhou  
*NeurIPS – Conference on Neural Information Processing Systems*, 2022
- [C4]. AdaAX - Explaining Recurrent Neural Networks by Learning Automata with Adaptive States  
Dat Hong<sup>†</sup>, Alberto Maria Segre, **Tong Wang\***  
*KDD – SIGKDD Conference on Knowledge Discovery and Data Mining*, 2022
- [J2]. Hybrid Predictive Model: When an Interpretable Model Collaborates with a Black-box Model  
**Tong Wang**, Qihang Lin  
*JMLR – Journal of Machine Learning Research*, 2021  
**Finalist, Best Paper Award at INFORMS Workshop on Data Mining & Decision Analytics, 2018.**
- [C5]. Transparency Promotion with Model-Agnostic Linear Competitors  
Hassan Rafique, **Tong Wang\***, Qihang Lin, Arshia Sighani  
*ICML – International Conference on Machine Learning*, 2020  
**Runner-up of Best Paper Awards at INFORMS Workshop on Data Science, 2019**
- [C6]. Interpretable Companions for Black-box Classifiers  
Danqing Pan, **Tong Wang**, Satoshi Hara  
*AISTATS - International Conference on Artificial Intelligence and Statistics*, 2020
- [C7]. Gaining Free or Low-Cost Interpretability with Interpretable Partial Substitute  
**Tong Wang**  
*ICML - International Conference on Machine Learning*, 2019
- [C8]. Multi-value Rule Sets for Interpretable Classification with Feature-Efficient Representations  
**Tong Wang**  
*NeurIPS - Conference on Neural Information Processing Systems*, 2018
- [J3]. A Bayesian Framework for Learning Rule Sets for Interpretable Classification  
**Tong Wang**, Cynthia Rudin, Finale Doshi-Velez, Yimin Liu, Erica Klampfl, Perry MacNeille  
*JMLR - Journal of Machine Learning Research*, 2017
- [C9]. Bayesian Rule Sets for Interpretable Classification  
**Tong Wang**, Cynthia Rudin, Finale Doshi-Velez, Yimin Liu, Erica Klampfl, Perry MacNeille  
*ICDM – The IEEE International Conference on Data Mining*, 2016
- [J4]. Finding Patterns with a Rotten Core: Data Mining for Crime Series with Core Sets [\[SG\]](#)  
**Tong Wang**, Cynthia Rudin, Daniel Wagner, Rich Sevieri  
*Big Data*, 2015  
**The Second Place for the INFORMS “Doing Good with Good OR” Award, 2015**

- [C10]. Learning to Detect Patterns of Crime [\[SG\]](#)

**Tong Wang**, Cynthia Rudin, Daniel Wagner, Rich Sevieri  
ECML/PKDD - *the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases*, 2013

**Ideas from this paper were adopted by the New York Police Department and are running live in their Domain Awareness System (see article). Media coverage on WIRED, Boston Globe, etc**

#### **BUSINESS JOURNAL PUBLICATIONS**

- [J5]. PIE – A Partially Interpretable Model with Black-box Refinement

**Tong Wang**, Yunyi Li, Jingyi Yang, Boxiang Wang  
IJOC - *INFORMS Journal on Computing*, Accepted

- [J6]. Making Early and Accurate Deep Learning Predictions to Help Disadvantaged Individuals in Medical Crowdfunding [\[SG\]](#)

**Tong Wang**, Fujie Jin, Lu Feng, Yuan Cheng, Yu Hu  
POM - *Production and Operations Management*, 2024

- [J7]. Same-Day Delivery with Fair Customer Service [\[BA\]](#)[\[SG\]](#)

Xinwei Chen, **Tong Wang**, Barrett Thomas, Marlin W. Ulmer  
EJOR - *European Journal on Operational Research*, 2022

- [J8]. Disjunctive Rule Lists

Ronilo Ragodos<sup>†</sup>, **Tong Wang**\*  
IJOC - *INFORMS Journal on Computing*, 2022

- [J9]. Paralanguage Classifier (PARA): An Algorithm for Automatic Coding of Paralinguistic Nonverbal Parts of Speech in Text [\[BA\]](#)

Andrea Luangrath, Yixiang Xu, **Tong Wang**  
JMR - *Journal of Marketing Research*, 2022

- [J10]. Causal Rule Sets for Identifying Subgroups with Enhanced Treatment Effect

**Tong Wang**, Cynthia Rudin  
IJOC – *INFORMS Journal on Computing*, 2022

- [J11]. Evaluating the Effectiveness of Marketing Campaigns for Malls Using A Novel Interpretable Machine Learning Model [\[BA\]](#)

**Tong Wang**, Cheng He, Fujie Jin, Yu Jeffrey Hu  
ISR – *Information Systems Research*, 2021

- [J12]. A Holistic Approach to Interpretability in Financial Lending: Models, Visualizations, and Summary-Explanations [\[BA\]](#)

Chaofan Chen, Kangcheng Lin, Cynthia Rudin, Yaron Shaposhnik, Sijia Wang, **Tong Wang**  
(Author names are listed alphabetically)  
DSS – *Decision Support Systems*, 2021

**Winner of FICO Recognition Award in FICO xML Challenge**, 2018

#### **ARTICLES IN HEALTHCARE AND SOCIOLOGY JOURNALS**

- [J13]. Dental Anomaly Detection Using Intraoral Photos Via Deep Learning [\[SG\]](#)

Ronilo Ragodos<sup>†</sup>, **Tong Wang**\*, George L. Wehby, Seth M. Weinberg, Deborah V. Dawson, Mary L. Marazita, Lina M. Moreno Uribe, Brian J. Howe\*  
*Nature Scientific Reports*, 2022

- [J14]. Humans in the Loop: Priors and Missingness on the Road to Prediction [\[SG\]](#)

Anna Filippova, Connor Gilroy, Ridhi Kashyap, Antje Kirchner, Allison C. Morgan, Kivan Polimis, Adaner Usmani, **Tong Wang**  
(Author names are listed alphabetically)  
*Socius*, 2019

- [J15]. Prevalence and Predictors of C. Difficile Infections in Those Who Had Major Surgical Procedures in USA: Analysis Using the Traditional and Machine Learning Methods [\[SG\]](#)  
 Veerajalandhar Allareddy, **Tong Wang**, Sankeerth Rampa, Jennifer Caplin, Romesh P Nalliah, Aditya Badheka, Veerasathpurush Allareddy  
*American Journal of Surgery*, 2018

#### OTHER PUBLICATIONS

- [W1]. Next Hit Predictor - Self-exciting Risk Modeling for Predicting Next Locations of Serial Crimes [\[SG\]](#)  
 Yunyi Li<sup>†</sup>, **Tong Wang**  
*NeurIPS Workshop on AI for Social Good*, 2018
- [W2]. Interpretable Patient Mortality Prediction with Multi-value Rule Sets [\[SG\]](#)  
**Tong Wang**, Veerajalandhar Allareddy, Sankeerth Rampa, Veerasathpurush Allareddy  
*KDD Workshop on Machine Learning for Medicine and Healthcare*, 2018
- [W3]. Detecting Patterns of Crime with Series Finder [\[SG\]](#)  
**Tong Wang**, Cynthia Rudin, Daniel Wagner, Rich Sevieri  
*AAAI Late Breaking Track - Twenty-Seventh AAAI Conference on Artificial Intelligence*, 2013
- [C11]. Network Coded Storage with Multi-Resolution Codes  
 Ulric J. Ferner, **Tong Wang**, Muriel Medard  
*Asilomar Conference on Signals, Systems, and Computers*, 2013
- [C12]. Joint Design of Multi-Resolution Codes and Intra/Inter-Layer Network Coding  
**Tong Wang**, Muriel Medard, Lizhong Zheng,  
*Asilomar Conference on Signals, Systems, and Computers*, 2012
- [J16]. On the Design of Network Coding for Multiple Two Way Relaying Channels  
 Zhiguo Ding, **Tong Wang**, Mugen Peng, Wenbo Wang  
*TWC – IEEE Transactions on Wireless Communications*, 2011

PATENT                      Medard, M., Ferner, U., and Wang, T., “Network Coded Storage With Multi-Resolution Codes”, US Patent App. 13/965,721. 2017.

#### SELECTED PRESENTATIONS AT BUSINESS CONFERENCES

- Can Your Toothpaste Shopping Predict Mutual Fund Purchasing? Transferring Knowledge from Consumer Goods to Financial Products via Machine Learning  
 Shenghao Wang, **Tong Wang**, Cheng He and Yu Jeffrey Hu
  - SCECR - *Symposium on Statistical Challenges in Electronic Commerce Research*, 2022
  - ISMS *Marketing Science Conference*, 2022
  - CIST - *Conference on Information Systems and Technology*, 2021
- Picture Perfect: How Image Features Influence Herding Behavior in Medical Crowdfunding  
 Fujie Jin, Junho Yoon, **Tong Wang** (equal contributions)  
 SCECR - *Symposium on Statistical Challenges in Electronic Commerce Research*, 2022
- The Causal Impact of Mall Entry on Incumbents: Substitution, Agglomeration and the Key Role of Mall Positioning  
 Lu Feng, Keyan Zhu, Cheng He, **Tong Wang**, Yu Jeffrey Hu  
 ISMS *Marketing Science Conference*, 2022
- Augmented Fairness: An Interpretable Model Augmenting Decision-Makers’ Fairness  
**Tong Wang**, Maytal Saar-Tsechansky  
 INFORMS *Workshop on Data Science*, 2020

- Transparency Promotion with Model-Agnostic Linear Competitors  
Hassan Rafique, **Tong Wang\***, Qihang Lin  
(\* corresponding author)  
*INFORMS Workshop on Data Science*, 2019
- Does Having More Friends Reduce Cancer Risks? – Evidence from New Mobile-Based Health Data  
Yuan Cheng, Yu Jeffrey Hu, Fujie Jin and **Tong Wang**  
*SCECR - Symposium on Statistical Challenges in Electronic Commerce Research*, 2019

#### FUNDED RESEARCH

- Co-PI for NSF Award: 21-530 Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science. 2023
- Interpretable Machine Learning for Assisting Electronic Chip Design, funded by InZone.AI, Jun - Aug, 2017; Jan - May, 2018
- Research Excellence Internal Grant, awarded by Tippie College of Business, April, 2019

#### SELECTED AWARDS

Winner of the Data Mining Best Paper Award Competition.	Oct, 2023
Winner of the Best Paper Award at INFORMS Workshop on Data Science	Nov, 2020
Runner-up for the Best Paper Awards at INFORMS Workshop on Data Science	Oct, 2019
Research Excellence Award, Tippie College of Business, University of Iowa	2019
FICO Recognition Award, FICO Explainable Machine Learning Challenge	Dec, 2018
Finalist for the Best Paper Awards at 13th INFORMS DM&DA Workshop	Nov, 2018
Second place winner of “Doing Good with Good OR”, INFORMS	Nov, 2015
LinkedIn Intern Women in Tech Scholarship	2014
Presidential fellowship – Joan and Irwin Jacobs fellowship, MIT	2010 - 2011
Best Bachelor Thesis Award, BUPT	2010

#### TEACHING EXPERIENCE

University of Iowa BAIS:3500 (Data Mining - Undergrad Level)  
University of Iowa BAIS:6070 (Data Science - MSBA Level)  
University of Iowa BAIS:7000 (Interpretable machine Learning - PhD Level)

#### INDUSTRY EXPERIENCE

<b>LinkedIn</b>	Mountain View, CA
Data Science Intern at Search, Network and Analysis Team	Jun - Aug, 2014
<b>Groupon</b>	Palo Alto, CA
Data Science Intern at Merchant Engineering Team	Jun - Aug, 2013

#### STUDENTS

Shenghao Wang, PhD Candidate in Business Analytics  
Ronilo Ragodos, PhD Candidate in Business Analytics  
Dat Hong, PhD Candidate in Computer Science

#### ACADEMIC SERVICES

<b>GRANT REVIEW</b>	
National Science Foundation Panelist	2019 and 2021
<b>ORGANIZING ROLES</b>	
Cluster chair for Making Sense of AI Cluster, INFORMS Annual Meeting	2022
Web chair for Workshop on Information Technologies and Systems	2021
Co-chair for 2019 INFORMS Workshop on Data Mining and Analytics	2019
Chair for Data Mining Best Paper Competition, INFORMS	2017, 2018
Council member for Data Mining Section, INFORMS,	2016 - 2018
Session chairs at INFORMS	2016 - 2022
<b>REVIEW SERVICE</b>	
COMPUTER SCIENCE CONFERENCES AND JOURNALS	
Area Chair for FAccT	2023
Reviewer for JMLR, NeurIPS, ICML, ICLR, AISTATS, AAAI, IJCAI, FATML, TKDE, Machine Learning	

Journal, etc

BUSINESS JOURNALS

Associate Editor, INFORMS Journal on Computing

2023 - present

Reviewer for Management Science, Information Systems Research, MIS Quarterly, Manufacturing & Service Operations Management, Production and Operations Management