

Tong Wang

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

EMPLOYMENT	Yale University, School of Management Assistant Professor of Marketing	New Haven, CT 2023 - PRESENT
	University of Iowa, Tippie College of Business Assistant Professor of Business Analytics (promotion and tenure awarded in 2023)	Iowa City, IA 2016 - 2023
EDUCATION	Massachusetts Institute of Technology Ph.D. in Computer Science M.S. in Electrical Engineering and Computer Science	Cambridge, MA 2012 - 2016 2010 - 2012
	Beijing University of Posts and Telecommunications 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 interpretable machine learning 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">Using Advanced LLMs to Enhance Smaller LLMs: An Interpretable Knowledge Distillation Approach Tong Wang, K. Sudhir and Dat Hong Reject and Resubmit, <i>Marketing Science</i>Modeling Vendor Survival on Multi-Vendor Platforms: Insights and Interpretable Predictions for Restaurants in Shopping Malls Yingsi Huang, Lan Wang, Tong Wang, and Yu Jeffrey Hu Reject and Resubmit, <i>Production and Operations Management</i>From Model Explanation to Data Misinterpretation: Uncovering the Pitfalls of Post Hoc Explainers in Business Research Ronilo Ragodos[†], Tong Wang[*], Lu Feng, and Yu Jeffrey Hu Major Revision, <i>Management Science</i>The Case for Value-Driven AI Advisors and a Framework for Producing Them [BA][SG] Nicholas Wolczynski, Maytal Saar-Tsechansky, Tong WangConProGAIL: Interpretable Policy Learning via Conceptual Prototyping for Human Spatiotemporal Decision Understanding Ronilo Ragodos, Xun Zhou, Tong Wang, and Jun LuoPersonalized Path Recourse Dat Hong, Tong Wang[*]Optimized Rule Sets M. Cristina Molero Del Rio, Boxuan Li, Tong Wang, and Cynthia Rudin	

8. Augmented Fairness: An Interpretable Model Augmenting Decision-Makers' Fairness
Tong Wang, Maytal Saar-Tsechansky
Best Paper Award at 2020 INFORMS Workshop on Data Science

PUBLISHED

MACHINE LEARNING CONFERENCE AND JOURNAL PUBLICATIONS

- [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[†], **Tong Wang***, Stephen Baek
 JMLR – *Journal of Machine Learning Research*, 2023
- [C3]. ProtoX – Explaining a Reinforcement Learning Agent via Prototyping
 Ronilo Ragodos[†], **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[†], 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[†], **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[†], **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[†], **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
(* correponding 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

LinkedIn	Mountain View, CA
Data Science Intern at Search, Network and Analysis Team	Jun - Aug, 2014
Groupon	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

GRANT REVIEW	
National Science Foundation Panelist	2019 and 2021
ORGANIZING ROLES	
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

REVIEW SERVICE

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