

# Tong Wang

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Google Scholar

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EMPLOYMENT	<b>Yale University, School of Management</b> Assistant Professor of Marketing Faculty Fellow at Center for Algorithms, Data, and Market Design	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	<sup>†</sup> student under my supervision * corresponding author + Equal Contribution	
WORKING PAPERS	1. Can Advanced LLMs Coach Smaller LLMs? Knowledge Distillation for Goal-Oriented Dialogs <b>Tong Wang</b> , K. Sudhir and Dat Hong 2. Why it Works: Can LLM Hypotheses Improve AI Generated Marketing Content? <b>Tong Wang</b> , K. Sudhir and Hengguang Zhou ( <i>Top downloads on SSRN</i> ) 3. Modeling Serialized Media Engagement Dynamics via Adversarial IRL with Content Embeddings Peter Lee, K. Sudhir and <b>Tong Wang</b> 4. 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	
PUBLISHED	<b>MARKETING AND MANAGEMENT</b>	
	[J1]. Making Early and Accurate Deep Learning Predictions to Help Disadvantaged Individuals in Medical Crowdfunding <b>Tong Wang</b> , Fujie Jin, Lu Feng, Yuan Cheng, Yu Hu POM - <i>Production and Operations Management</i> , 2024	
	[J2]. Paralanguage Classifier (PARA): An Algorithm for Automatic Coding of Paralinguistic Nonverbal Parts of Speech in Text Andrea Luangrath, Yixiang Xu, <b>Tong Wang</b> JMR - <i>Journal of Marketing Research</i> , 2022	

- [J3]. Evaluating the Effectiveness of Marketing Campaigns for Malls Using A Novel Interpretable Machine Learning Model

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

**MACHINE LEARNING METHODS (JOURNAL AND TOP CONFERENCE)**

- [C1]. ProtoPairNet: Interpretable Regression through Prototypical Pair Reasoning  
Rose Gurung, Ronilo Ragodos<sup>†</sup>, Chiyu Ma, **Tong Wang**, and Chaofan Chen  
NeurIPS – *Conference on Neural Information Processing Systems*, 2025

- [J1]. PIE – A Partially Interpretable Model with Black-box Refinement

**Tong Wang**, Yunyi Li, Jingyi Yang, Boxiang Wang  
IJOC - *INFORMS Journal on Computing*, 2025

- [C2]. Improving Decision Sparsity

Yiyang Sun, **Tong Wang**, and Cynthia Rudin  
NeurIPS – *Conference on Neural Information Processing Systems*, 2024

- [C3]. Sparse and Faithful Explanations Without Sparse Models

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**<sup>\*</sup>, Stephen Baek  
JMLR – *Journal of Machine Learning Research*, 2023

- [C4]. ProtoX – Explaining a Reinforcement Learning Agent via Prototyping

Ronilo Ragodos<sup>†</sup>, **Tong Wang**<sup>\*</sup>, Qihang Lin, Xun Zhou  
NeurIPS – *Conference on Neural Information Processing Systems*, 2022

- [C5]. AdaAX - Explaining Recurrent Neural Networks by Learning Automata with Adaptive States

Dat Hong<sup>†</sup>, Alberto Maria Segre, **Tong Wang**<sup>\*</sup>  
KDD – *SIGKDD Conference on Knowledge Discovery and Data Mining*, 2022

- [J2]. Causal Rule Sets for Identifying Subgroups with Enhanced Treatment Effect

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

- [J3]. 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.**

- [C6]. Transparency Promotion with Model-Agnostic Linear Competitors

Hassan Rafique, **Tong Wang**<sup>\*</sup>, Qihang Lin, Arshia Sighani  
ICML – *International Conference on Machine Learning*, 2020  
**Runner-up of Best Paper Awards at INFORMS Workshop on Data Science, 2019**

- [C7]. Interpretable Companions for Black-box Classifiers

Danqing Pan, **Tong Wang**, Satoshi Hara  
AISTATS - *International Conference on Artificial Intelligence and Statistics*, 2020

- [C8]. Gaining Free or Low-Cost Interpretability with Interpretable Partial Substitute

**Tong Wang**  
ICML - *International Conference on Machine Learning*, 2019

- [C9]. Multi-value Rule Sets for Interpretable Classification with Feature-Efficient Representations

**Tong Wang**  
NeurIPS - *Conference on Neural Information Processing Systems*, 2018

- [J4]. 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

#### MACHINE LEARNING APPLICATIONS

- [C10]. ConPro-GAIL: Interpretable Policy Learning via Conceptual Prototyping for Human Spatiotemporal Decision Understanding  
Ronilo Ragodos, Xun Zhou, **Tong Wang**, Yajun Pan, and Jun Luo  
*ACM SIGSPATIAL 2025*
- [C11]. Learning to Detect Patterns of Crime  
**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**
- [J5]. Finding Patterns with a Rotten Core: Data Mining for Crime Series with Core Sets  
**Tong Wang**, Cynthia Rudin, Daniel Wagner, Rich Sevieri  
*Big Data*, 2015  
**The Second Place for the INFORMS "Doing Good with Good OR" Award, 2015**
- [J6]. Same-Day Delivery with Fair Customer Service  
Xinwei Chen, **Tong Wang**, Barrett Thomas, Marlin W. Ulmer  
*EJOR - European Journal on Operational Research*, 2022
- [J7]. Disjunctive Rule Lists  
Ronilo Ragodos<sup>†</sup>, **Tong Wang**<sup>\*</sup>  
*IJOC - INFORMS Journal on Computing*, 2022
- [J8]. A Holistic Approach to Interpretability in Financial Lending: Models, Visualizations, and Summary-Explanations  
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**
- [J9]. Dental Anomaly Detection Using Intraoral Photos Via Deep Learning  
Ronilo Ragodos<sup>†</sup>, **Tong Wang**<sup>\*</sup>, George L. Wehby, Seth M. Weinberg, Deborah V. Dawson, Mary L. Marazita, Lina M. Moreno Uribe, Brian J. Howe<sup>\*</sup>  
*Scientific Reports*, 2022
- [J10]. Humans in the Loop: Priors and Missingness on the Road to Prediction  
Anna Filippova, Connor Gilroy, Ridhi Kashyap, Antje Kirchner, Allison C. Morgan, Kivan Polimis, Adaner Usmani, **Tong Wang**  
(Author names are listed alphabetically)  
*Socius*, 2019
- [J11]. Prevalence and Predictors of C. Difficile Infections in Those Who Had Major Surgical Procedures in USA: Analysis Using the Traditional and Machine Learning Methods  
Veerajalandhar Allareddy, **Tong Wang**, Sankeerth Rampa, Jennifer Caplin, Romesh P Nalliah, Aditya Badheka, Veerasathpurush Allareddy  
*American Journal of Surgery*, 2018

FUNDED RESEARCH	<ul style="list-style-type: none"> <li>Co-PI for NSF Award: 21-530 Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science. 2023</li> <li>Interpretable Machine Learning for Assisting Electronic Chip Design, funded by InZone.AI, Jun - Aug, 2017; Jan - May, 2018</li> <li>Research Excellence Internal Grant, awarded by Tippie College of Business, April, 2019</li> </ul>	
SELECTED AWARDS	<p>Winner of the Data Mining Best Paper Award Competition, INFORMS Worshop on Data Science. Oct, 2023</p> <p>Winner of the Best Paper Award at INFORMS Workshop on Data Science</p> <p>Runner-up for the Best Paper Awards at INFORMS Worshop on Data Science</p> <p>Research Excellence Award, Tippie College of Business, University of Iowa</p> <p>FICO Recognition Award, FICO Explainable Machine Learning Challenge</p> <p>Finalist for the Best Paper Awards at 13th INFORMS DM&amp;DA Workshop</p> <p>Second place winner of "Doing Good with Good OR", INFORMS</p> <p>LinkedIn Intern Women in Tech Scholarship</p> <p>Presidential fellowship – Joan and Irwin Jacobs fellowship, MIT</p> <p>Best Bachelor Thesis Award, BUPT</p>	Nov, 2020 Oct, 2019 2019 Dec, 2018 Nov, 2018 Nov, 2015 2014 2010 - 2011 2010
PRESENTATIONS	<p><i>"Why it Works: Can LLM Hypotheses Improve AI Generated Marketing Content?"</i></p> <ul style="list-style-type: none"> <li>University of Houston</li> <li>Amazon Advertising (<b>industry talk</b>)</li> <li>INFORMS Annual Meeting, Atlanta</li> <li>Conference on Information Systems and Technology, Atlanta</li> <li>Disney, Florida (<b>industry talk</b>)</li> <li>AI and Collaborative Innovation @ NYU</li> <li>The Ohio State University Fisher College of Business</li> <li>University of Massachusetts Amherst</li> <li>Marketing Science Conference, Washington DC</li> <li>Symposium on Artificial Intelligence in Marketing, Wisconsin Madison</li> <li>Artificial Intelligence in Management conference, Los Angeles</li> <li>Offerfit, Inc (<b>industry talk</b>)</li> <li>BizAI, Dallas</li> <li>(Keynote) Conference on Artificial Intelligence, Machine Learning, and Business Analytics, Yale Dec, 2024</li> </ul> <p><i>"Can Advanced LLMs Coach Smaller LLMs? Knowledge Distillation for Goal-Oriented Dialogs"</i></p> <ul style="list-style-type: none"> <li>University of Connecticut Operations and Information Management</li> <li>Virtual Quant Marketing Seminar</li> <li>CMU Tepper Operations Research</li> <li>NeurIPS workshop on Interpretable AI: Past, Present and Future</li> <li>Samsung Research America (<b>industry talk</b>)</li> <li>University of Berkeley Hass</li> <li>University of Rochester Simon Business School</li> <li>Fidelity AI Center (<b>industry talk</b>)</li> <li>Purdue University Mitch Daniels School of Business</li> <li>Summer Workshop on AI for Business</li> <li>Tsinghua University School of Economics and Management</li> <li>Hongkong University</li> <li>Chinese University of Hongkong</li> <li>Four School Conference</li> <li>BizAI, Dallas</li> </ul>	Mar, 2026 Nov, 2025 Oct, 2025 Oct, 2025 Sep, 2025 Sep, 2025 Sep, 2025 Sep, 2025 Jun, 2025 May, 2025 Mar, 2025 Mar, 2025 Mar, 2025 Mar, 2025 Apr, 2025 Feb, 2025 Jan, 2025 Dec, 2024 Dec, 2024 Nov, 2024 Oct, 2024 Sep, 2024 Sep, 2024 June, 2024 June, 2024 May, 2024 May, 2024 May, 2024 Mar, 2024

<b>PATENT</b>	Medard, M., Ferner, U., and Wang, T., "Network Coded Storage With Multi-Resolution Codes", US Patent App. 13/965,721. 2017.
<b>TEACHING EXPERIENCE</b>	<p>Yale MGT 554 (AI for Business Decisions)          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)</p>
<b>ACADEMIC SERVICES</b>	<p><b>GRANT REVIEW</b>          National Science Foundation Panelist <span style="float: right;">2019 and 2021</span></p> <p><b>ORGANIZING ROLES</b>          Cluster chair for Making Sense of AI Cluster, INFORMS Annual Meeting <span style="float: right;">2022</span>          Web chair for Workshop on Information Technologies and Systems <span style="float: right;">2021</span>          Co-chair for 2019 INFORMS Workshop on Data Mining and Analytics <span style="float: right;">2019</span>          Chair for Data Mining Best Paper Competition, INFORMS <span style="float: right;">2017, 2018</span>          Council member for Data Mining Section, INFORMS, <span style="float: right;">2016 - 2018</span>          Session chairs at INFORMS <span style="float: right;">2016 - 2022</span></p>
	<p><b>REVIEW SERVICE</b>  <b>COMPUTER SCIENCE CONFERENCES AND JOURNALS</b>          Area Chair for FAccT <span style="float: right;">2023</span>          Reviewer for JMLR, NeurIPS, ICML, ICLR, AISTATS, AAAI, IJCAI, FATML, TKDE, Machine Learning Journal, etc</p> <p><b>BUSINESS JOURNALS</b>          Associate Editor, INFORMS Journal on Computing <span style="float: right;">2023 - present</span>          Reviewer for Management Science, Information Systems Research, MIS Quarterly, Manufacturing &amp; Service Operations Management, Production and Operations Management</p>