Tong Wang

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Google Scholar

Employment

Yale University, School of Management — New Haven, CT
Assistant Professor of Marketing — 2023 - Present
Faculty Fellow at Center for Algorithms, Data, and Market Design

University of Iowa, Tippie College of Business — Iowa City, IA
Assistant Professor of Business Analytics — 2016 - 2023
(*promotion and tenure awarded in 2023*)

Education

Massachusetts Institute of Technology — Cambridge, MA
Ph.D. in Computer Science — 2012 - 2016
M.S. in Electrical Engineering and Computer Science — 2010 - 2012

Beijing University of Posts and Telecommunications — Beijing, China
B.S. in Electrical Engineering with *Highest Distinction* — 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

Working Papers

1. Modeling Serialized Media Engagement Dynamics via Adversarial IRL with Content Embeddings
   Peter Lee†, K. Sudhir and **Tong Wang**
2. Large Language Models as Engines of Understanding - Interpretable Discriminative Representations of Texts via LLM Hypotheses
   Tong Wang, Yiqing Xu, Leo Yang
3. Can Advanced LLMs Coach Smaller LLMs? Knowledge Distillation for Goal-Oriented Dialogs
   Tong Wang, K. Sudhir and Dat Hong†
   Major Revision, *Marketing Science*
4. Why it Works: Can LLM Hypotheses Improve AI Generated Marketing Content?
   Tong Wang, K. Sudhir and Hengguang Zhou†
   Major Revision, *Journal of Marketing Research*
5. From Model Explanation to Data Misinterpretation: Uncovering the Pitfalls of Post Hoc Explainers in Business Research
   Tong Wang∗, Ronilo Ragodos†, Lu Feng, and Yu Jeffrey Hu
   Major Revision, *Management Science*

Published

Marketing and Management

[J1]. Making Early and Accurate Deep Learning Predictions to Help Disadvantaged Individuals in Medical Crowdfunding

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

[J2]. Paralanguage Classifier (PARA): An Algorithm for Automatic Coding of Paralinguistic Nonverbal Parts of Speech in Text

Andrea Luangrath, Yixiang Xu, **Tong Wang**
JMR - *Journal of Marketing Research*, 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†, Chiyu Ma, **Tong Wang**, and Chaofan Chen
NeurIPS – *Conference on Neural Information Processing Systems*, 2025

[J4]. 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

[J5]. Interpretable Text Classification Via Prototype Trajectory

Dat Hong†, **Tong Wang***, Stephen Baek
JMLR –*Journal of Machine Learning Research*, 2023

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

Ronilo Ragodos†, **Tong Wang***, 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†, Alberto Maria Segre, **Tong Wang***
KDD – *SIGKDD Conference on Knowledge Discovery and Data Mining*, 2022

[J6]. Causal Rule Sets for Identifying Subgroups with Enhanced Treatment Effect

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

[J7]. 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***, 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

[J8]. 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

[J9]. Same-Day Delivery with Fair Customer Service

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

[J10]. Disjunctive Rule Lists

Ronilo Ragodos[†], **Tong Wang***
IJOC - *INFORMS Journal on Computing*, 2022

[J11]. Dental Anomaly Detection Using Intraoral Photos Via Deep Learning

Ronilo Ragodos[†], **Tong Wang**[*], George L. Wehby, Seth M. Weinberg, Deborah V. Dawson, Mary L. Marazita, Lina M. Moreno Uribe, Brian J. Howe[*]
Scientific Reports, 2022

[J12]. 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

[J13]. Humans in the Loop: Incorporating Expert and Crowd-Sourced Knowledge for Predictions Using Survey Data

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

[J14]. 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

[J15]. 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

[C11]. Learning to Detect Patterns of Crime

Tong Wang, Cynthia Rudin, Daniel Wagner, Rich Sevieri

ECML-PKDD - *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

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, INFORMS Worshop on Data Science. 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 Worshop 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

Presentations

2026	China Europe International Business School, University of Houston, Leeds AI Research Forum, Frank M. Bass UTD FORMS Conference
2025	University of Connecticut Operations and Information Management, Virtual Quant Marketing Seminar, CMU Tepper Operations Research, Amazon Advertising, INFORMS Annual Meeting (Atlanta), Conference on Information Systems and Technology (Atlanta), Disney (Florida), AI and Collaborative Innovation @ NYU, The Ohio State University Fisher College of Business, University of Massachusetts Amherst, Marketing Science Conference (Washington DC), Symposium on Artificial Intelligence in Marketing (Wisconsin-Madison), Artificial Intelligence in Management Conference (Los Angeles), Offerfit, Inc., BizAI (Dallas)
2024	Conference on Artificial Intelligence, Machine Learning, and Business Analytics (Yale), NeurIPS Workshop on Interpretable AI, Samsung Research America, UC Berkeley Haas, University of Rochester Simon Business School, Fidelity AI Center, Purdue University Mitch Daniels School of Business, Summer Workshop on AI for Business, Tsinghua University School of Economics and Management, University of Hong Kong, Chinese University of Hong Kong, Four School Conference @ Columbia University, BizAI (Dallas)

Patent

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

Teaching Experience

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)

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