Yingxue Zhang

Worcester Polytechnic Institute
Data Science Department
Atwater Kent Laboratories, #123
100 Institute Road
Worcester, MA 01609

Address: 77 Elm St, APT 31, Worcester, MA 01609
Email: yzhang31@wpi.edu
Homepage: https://yingxuezhang.com
Github: https://github.com/yingxue-zhang
Phone: +1 (551) 263-9462

Research Summary	Ph.D. candidate in Data Science with strong machine learning and deep learning background. Broad research interests include: (1) designing novel data mining, machine learning and AI techniques to solve spatial-temporal big data analytics problems related to smart cities, public safety, sustainability and business, and (2) human behavior analysis in autonomous driving, financial market and decision making using meta-learning, reinforcement learning and imitation learning methods.

Education

Worcester Polytechnic Institute (WPI), Worcester, MA　　Aug 2018-June 2022
Ph.D. Candidate, Data Science, Data Science Department
Thesis (in progress): Spatial-Temporal Urban Data Estimation in a Deep Generative Adversarial Perspective.

Stevens Institute of Technology, Hoboken, NJ　　Aug 2016-May 2018
M.S., Financial Engineering (Data Science Track), School of Business

Shanghai Jiao Tong University, Shanghai, China　　Sep 2012-July 2016
B.E., Computer Science, School of Electronic, Information and Electrical Engineering

Research Experience

Data Science Department, Worcester Polytechnic Institute, Worcester, MA
Research Assistant　　Aug 2018-Aug 2020
Adviser: Dr.Yanhua Li

Project 1: Designed a novel imitation learning model SMT-GAIL to learn diverse human driver strategies through meta-learning and generative adversarial imitation learning (GAIL).

Project 2: Proposed to combine generative adversarial networks with transfer learning framework in multiple-source setup aiming to solve the traffic estimation problem in a city suffering data scarcity.

Project 3: Proposed a novel generative adversarial networks C^3-GAN to solve the complex-condition-controlled spatial data generation problem by designing unique architectures and algorithms to map the complex conditions to a latent space and find high-quality representations.

Project 4: Proposed a Continuous Spatial-Temporal Meta-Learning method for traffic dynamics prediction which advanced the Bayesian meta-learning framework with variational inference and deep neural networks to better capture the temporal uncertainties of time series data.

Project 5: Proposed a novel generative adversarial networks Curb-GAN which embedded dynamic convolutional layers and self-attention mechanism into cGAN to solve the spatial-temporal urban data estimation problem.

Project 6: Designed a novel generative adversarial networks TrafficGAN to better capture the spatial patterns of spatial-temporal data.

Nuro, Mountain View, CA
Research Intern   May 2021-Aug 2021

Project: Designed attention-based model for trajectory prediction and behavior planning for autonomous vehicles.

Teaching Experience

Computer Science Department, Worcester Polytechnic Institute
Teaching Assistant   Jan 2020-Present
Course: Database Management Systems (CS 542)
Responsibilities: in-person and online hybrid teaching, grading, project instructor, office hours.

Foisie Business School, Worcester Polytechnic Institute
Guest Lecturer   May 2021
Course: Introduction to Data Science (DS1010)
Responsibilities: sharing research experiences and academic career path about data science to undergraduate students.

Data Science Department, Worcester Polytechnic Institute
Teaching Assistant   Aug 2020-Dec 2020
Course: Reinforcement Learning (DS 595)
Responsibilities: online teaching, grading, project instructor, coding lecturer, office hours.

Conference Publications

[C1] **Yingxue Zhang**, Yanhua Li, Xun Zhou, Zhenming Liu and Jun Luo. C^3-GAN: Complex-Condition-Controlled Urban Traffic Estimation through Generative Adversarial Networks. 2021 IEEE International Conference on Data Mining (ICDM).

[C2] **Yingxue Zhang**, Yanhua Li, Xun Zhou, Xiangnan Kong and Jun Luo. Curb-GAN: Conditional Urban Traffic Estimation through Spatio-Temporal Generative Adversarial Networks. In Proceedings of the 26th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD '20).

[C3] **Yingxue Zhang**, Yanhua Li, Xun Zhou and Jun Luo. cST-ML: Continuous Spatial-Temporal Meta-Learning for Traffic Dynamics Prediction. 2020 IEEE International Conference on Data Mining (ICDM)

[C4] Han Bao, Xun Zhou, **Yingxue Zhang**, Yanhua Li, Yiqun Xie. COVID-GAN: Estimating Human Mobility Responses to COVID-19 Pandemic through Spatio-Temporal Conditional Generative Adversarial Networks. In Proceedings of the 28th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems.

[C5] **Yingxue Zhang**, Yanhua Li, Xun Zhou, Xiangnan Kong and Jun Luo. Traffic-GAN: Off-Deployment Traffic Estimation with Traffic Generative Adversarial Networks. 2019 IEEE International Conference on Data Mining (ICDM).

[C6] **Yingxue Zhang**, Yanhua Li, Xun Zhou and Jun Luo. STrans-GAN: Spatially-Transferable Generative Adversarial Networks for Urban Traffic Estimation. *Under submission.*

Journal Publications	**[J1]** **Yingxue Zhang**, Yanhua Li, Xun Zhou, Jun Luo and Zhi-Li Zhang. Urban Traffic Dynamics Prediction — A Continuous Spatial-Temporal Meta-Learning Approach. In ACM Transactions on Intelligent Systems and Technology (TIST).
	[J2] Han Bao, Xun Zhou, **Yingxue Zhang**, Yanhua Li, and Yiqun Xie. COVID-GAN+: Estimating Human Mobility Responses to COVID-19 through Spatio-Temporal Generative Adversarial Networks with Enhanced Features. In ACM Transactions on Intelligent Systems and Technology (TIST).
	[J3] **Yingxue Zhang**, Yanhua Li, Xun Zhou, Xiangnan Kong and Jun Luo. Off-Deployment Traffic Estimation — A Traffic Generative Adversarial Networks Approach. In IEEE Transactions on Big Data (TBD).
	[J4] **Yingxue Zhang**, Yanhua Li, Xun Zhou, Zhenming Liu and Jun Luo. C^3-GAN$^+$: Complex-Condition-Controlled Generative Adversarial Networks with Enhanced Embeddings. *Under submission.*

Conference Presentations	**IEEE International Conference on Data Mining (ICDM)**	
	Conference Presentor	Virtual event, Nov 2020
	ACM SIGKDD Conference on Knowledge Discovery and Data Mining	
	Conference Presentor	Virtual event, Aug 2020
	Graduate Research Innovation Exchange (GRIE)	
	Poster Presentor	Virtual event, Feb 2020
	IEEE International Conference on Data Mining (ICDM)	
	Conference Presentor	Beijing, China, Nov 2019
	Graduate Research Innovation Exchange (GRIE)	
	Poster Presentor	Worcester, MA, Feb 2019

Mentoring Experience	**Mentor for Yiqing Zhang**, Ph.D. student in Data Science, WPI	Spring 2021
	Project: Activity-Based Travel Demand Modelling for Urban Planning	
	Mentor for Zixuan Zhang, Graduate student in Data Science, WPI	Fall 2020
	Project: Spatial-Temporal Data Analytics For Travel Demand Prediction	

Awards and Fellowships	**ICDM 2020 Student Travel Award**	2020
	ACM SIGKDD Student Registration Award	2020
	Graduate Fellowship by National Science Foundation	2018-2020
	Scholarship for International Students, Stevens Institute Technology	2016-2017

Academic Service	**Reviewer** for AAAI (2020, 2021), WWW (2020,2021) IJCAI (2019, 2020, 2021), KDD (2019, 2020, 2021), SDM (2020, 2021), ICLR 2021, CIKM (2019, 2020, 2021), ICDM (2020,2021)

Technical Skills	Python, R, C/C++
	PyTorch, TensorFlow, LaTeX, Matlab, SQL

References	**Zhi-Li Zhang**
	Qwest Chair Professor and McKnight Distinguished University Professor
	Associate Director for Research, Digital Technology Center

Department of Computer Science and Engineering
University of Minnesota
4-192 Keller Hall, 200 Union Street SE,
Minneapolis, MN 55416
Email: zhzhang@cs.umn.edu
Phone: (612) 625-8568

Yanhua Li
Associate Professor
Computer Science Department
Worcester Polytechnic Institute
Atwater Kent 130, 100 Institute Rd,
Worcester, MA 01609
Email: yli15@wpi.edu

Xun Zhou
Associate Professor
Department of Business Analytics, Tippie College of Business
The University of Iowa
S280 PBB 21 East Market Street,
Iowa City, IA 52242-1994
Email: xun-zhou@uiowa.edu
Phone: (319) 384-3335