Yurun Tian

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Education

- **Carnegie Mellon University** — Pittsburgh, PA
  PhD Student advised by Dr. Kathleen M. Carley (CS), Dr. Osman Yagan (ECE) | GPA: 3.93/4.00 — Expected 2026
  Research Interests: Complex Networks | Misinformation Control | Deep Learning
- **Carnegie Mellon University** — Pittsburgh, PA
  Master of Science in Electrical and Computer Engineering | GPA: 3.92/4.00 — Dec 2021
- **Xi'an Jiaotong University (XJTU)** — Xi'an, China
  Bachelor of Engineering in Software Engineering | GPA: 3.72/4.00 (top 10%) — May 2019

Awards & Honours

- **SNAP Research Fellowship semi-finalist**: SNAP Inc. 2022
- **Dean's Fellowship**: Carnegie Institute of Technology, Carnegie Mellon University, 2021
- **University Scholarship**: School of Software Engineering (SE), XJTU, 2018 (Awarded to **batch topper**)
- **Suzhou High-Tech Zone Student Scholarship**: **1st prize** , XJTU, 2017 (Awarded to 3 students in 5 schools)
- **Fuji Xerox (China) Scholarship**: School of SE, XJTU, 2016 (Awarded to 3 students in School of SE)
- **MCM Excellence Award**: The Mathematical Contest in Modeling, Xi'an China (regional level), 2016
- **Excellent Student**: Chongying College, XJTU, 2016, 2017, 2018
- **Chinese Olympiad (provincial level), 2015**: 3rd position in Physics and Chemistry.

Publications

- **Y. Tian**, O. Yağan, *'Spreading processes with population heterogeneity over multi-layer networks'*, IEEE ICC 2023, under review.
- **Y. Tian**, A. Sridhar, C. W. Wu, S. A. Levin, K. M. Carley, H. V. Poor, O. Yağan, *'The Role of Masks in Mitigating Viral Spread on Networks'*, Physical Review E, under review.
- **Y. Tian**, A. Sridhar, C. W. Wu, S. A. Levin, H. V. Poor, O. Yağan, *'The Role of Masks in Mitigating Viral Spread on Networks'*, NetSci 2022, May 2022.
- **Y. Tian**, A. Sridhar, O. Yağan, H. V. Poor, *'Analysis of the Impact of Mask-wearing in Viral Spread: Implications for COVID-19'*, American Control Conference (ACC 2021), May 2021
- BoDong, **Y. Tian**, et al, *'A Fake Tax Invoice Recognition Method Based on Dynamic Network Representation'*, Patent, CN110852856A, Feb 28, 2020

Research

- **Open-Domain Scientific QA** — LTI, CMU
  Advised by Dr. Pengfei Liu, Dr. Graham Neubig — Aug 2022 - present
  - Developing information retrieval + reading comprehension LM using scientific articles
  - Combining LMs with KGs to facilitate extractive QA on S2ORC dataset
- **Inherent Robustness of Deep Learning Models** — LTI, CMU
  Advised by Dr. Bhiksha Raj — Jan 2022 - present
  - Study how hyperparameter and network architecture choices affect the robustness of neural networks
  - Experiment with various DL elements such as CNN on synthetic XOR dataset, MNIST and CIFAR10
- **Measure user Negativity via Twitter messages and activities** — ISR, CMU
  Advised by Dr. Kathleen Carley, Dr Osman Yagan — Jan 2022 - present

- Measure negativity quantitatively with textual sentimental cues and patterns using Twitter messages
- Conduct topic-analysis and stance group detection on topological communities of Twitter networks

- **Mask-wearing in Virus Spreading** ECE, CMU
  Advised by Dr. Osman Yagan, Dr. H. V. Poor Jan 2021 - Present
  - Investigated mask-wearing in spreading processes over complex networks via a multi-type network
  - Predicted Epidemic Size and Probability of Emergence accurately with intensive simulations
  - Proposed mask-wearing strategies helping reduce the infected portion and probability of epidemic

- **Smart Promotions** ECE, CMU
  Advised by Dr Osman Yagan, Dr. Tze Meng Low, Dr. Hyong Kim Jan 2021 - Dec 2021
  - Cluster customers based on latent features by AE, PCA from transactions
  - Achieved 96% reconstruction accuracy by reducing 118 features to 2 features
  - Time-series forecasting of monthly sale volume via LSTM with teacher-forcing
  - Utilizing Random Forest feature selection to improve the interpretability of DL models

- **Deep Infinite Mixture Latent Variable Models** LTI, CMU
  Advised by Dr. Bhiksha Raj Sep 2021 - Jan 2022
  - We leverage ideas from Bayesian nonparametrics to model latent space models with infinite mixture models
  - Experiment with Gumbel Softmax GMVAE Model with varying number of components (10, 20, 22)
  - Applying Infinite GMMs to the latent representation from VAE, GMVAE to generate number of components

- **Dynamic Anomaly Detection** IAIR, XJTU
  Undergraduate Thesis Jan 2019 - May 2019
  - Developed a anomaly detection model based on dynamic multi-layer network representation learning
  - Accelerated the convex optimization problem by implementing the distributed ADMM algorithm
  - Achieved an accuracy of 89% on the AMiner dataset

Professional experience

- **Big Data Engineer** Sichuan, China
  Hwadee Information Co., Ltd, Internship Feb 2018 - March 2018
  - Constructed a Hadoop cluster with multiple hosts from scratch
  - Developed an ELK log analysis visualization framework via Filebeat, Kafka, Logstash, Elasticsearch and Kibana

Presentations & Talks

- Guest Lecture at 18755, CMU ECE, Nov 2022 *'The Role of Masks in Mitigating Viral Spread on Networks'*
- Conference Abstract Presentation, *'The Role of Masks in Mitigating Viral Spread on Networks',* CACCS 2022, Aug 2022
- Regular Talk, *'The Role of Masks in Mitigating Viral Spread on Networks',* NetSci 2022, July 2022
- Conference Paper Presentation, *'Analysis of the Impact of Mask-wearing in Viral Spread: Implications for COVID-19',* American Control Conference (ACC 2021), May 2021
- Technical Talk, *'Real-time Gesture Emotion Detection',* CMU Thailand Tech Summit, Bangkok, Jul 2019

Service

- *Reviewer*, Journal of Communications and Networks 2021

Coursework

- **Graduate-level:** Machine Learning (PhD, 10-701), Introduction to Deep Learning (11-785), Neural Networks for NLP (11-747), Machine Learning for Text and Graph-based Mining (11-641), Computer Systems (18-613), Image and Video Processing (18-793), Quantum Computing (11-860), Advanced Probability & Statistics (18-665), Dynamic Network Analysis (17-801)