MINGYUE TANG

+1(213) 245-4164 ⋄ Champaign, IL

mtang724@gmail.com ⋄ personalweb/mtang.fyi ⋄ github/mtang724

RESEARCH INTERESTS

Mobile Sensing, Mobile Computing, Signal Processing and Internet of Things, Data Mining, Pervasive Computing, Machine Learning in Internet of Things, Healthcare Systems.

EDUCATION

Ph.D. in Computer Science, University of Illinois Urbana-Champaign   Expected 2027
GPA: -/4.0, Advisor: Prof. Elahé Soltanaghai
Research Direction: Wireless networks and IoT applications using machine learning-based methods
M.Eng. in Systems Engineering [Ph.D. Transfer Out], University of Virginia (UVa)   2021 - 2023
GPA: 3.86/4.0, Advisor: Prof. Mehdi Boukhechba, Cyber-Physical Systems NRT Program
M.S. in Computer Science, University of Southern California (USC)   2019 - 2020
GPA: 3.72/4.0, Research Supervisors: Prof. Carl Yang (Emory University), Prof. José Luis Ambite
B.S. in Computer Science, Minor in Mathematics, Kean University   2014 - 2018
GPA: 3.68/4.0, Major GPA: 3.91/4.0, Degree Honors: Magna Cum Laude, Advisor: Prof. Pinata Winoto

SKILLS

Programming	Python, CircuitPython, Java, Scala, Matlab, C, JS, PHP, Shell, SQL, LaTeX
Deep Learning and ML	PyTorch, DGL, PyTorch Geometric (PyG), Tensorflow, Scikit-Learn, Huggingface
Tools	Raspberry Pi, Arduino, TI mmWave, AWS, Docker, Express NodeJS, MongoDB

PUBLICATIONS

*indicates co-first authors

[1] Wang, Z., **Tang, M.**, Toner, E., Larrazábal, M., Boukhechba, M., Teachman, B., Barnes L., Personalized Learning for State Anxiety Detection: A Case Study using Digital Linguistic Biomarkers, **EMBC** 2023

[2] **Tang, M.**, Gao, J., Yang, C., Dong, G., Campbell, B., Zoellner, J., Bowman, B., Rahman, E., Boukhechba, M., Mobile Sensing based Fluid Intake Anomaly Detection for End Stage Kidney Patients via Self-Attention Sensor Relation Dual Autoencoder, **CHIL** 2023, Oral (13.3%)

[3] Gao, J.*, **Tang, M.***, Wang, T., Campbell, B. (2022), PFed-LDP: A Personalized Federated Differential Privacy framework for IoT sensing, **SenSys** 2022 (Poster)

[4] Yang, C.*, Song, H.*, **Tang, M.**, Danon, L. , Vigfusson, Y. (2022). Dynamic Network Anomaly Modeling of Cell-Phone Call Detail Records for Infectious Disease Surveillance, **KDD** 2022, **Best Paper Award for Health Day**

[5] **Tang, M.**, Dong, G., Zoellner, J., Bowman B., Rahman E., Boukhechba, M. (2022), Using Ubiquitous Mobile Sensing and Temporal Sensor-Relation Graph Neural Network to Predict Fluid Intake of End Stage Kidney Patients, **IPSN** 2022

[6] **Tang, M.***, Yang, C.*, Li, P. (2022). Graph Auto-Encoder via Neighborhood Wasserstein Reconstruction, **ICLR** 2022

[7] Dong, G., **Tang, M.**, Wang, Z., Gao, J., Guo, S., Cai, L., ... Boukhechba, M. (2022). Graph Neural Networks in IoT: A Survey. ACM Transactions on Sensor Networks (**TOSN**)

[8] Boukhechba, M., **Tang, M.**, Zoellner, J., Bowman, B., Rahman, E. (2022). A Smartwatch Based System for Monitoring Fluid Consumption of End-Stage Kidney Patients, **AHFE** 2022

[9] Wang, Z.*, Xiong, H.*, **Tang, M.**, Boukhechba, M., Flickinger, T. , Barnes L. (2022). Mobile Sensing in the COVID-19 Era, SPJ Health Data Science journal (**SPJ HDS Journal**)

[10] Dong, G., **Tang, M.**, Cai, L., Barnes, L., Boukhechba, M. (2021). Semi-supervised Graph Instance Transformer for Mental Health Inference. **ICMLA** 2021

[11] **Tang, M.**, Xie, H., Tang, T.Y. (2018) Combining wAMAN and Matrix Factorization to Optimize One-Class Collaborative Filtering and Its Application in an Emotion-Aware Movie Recommendation System, Proceedings of the 2018 International Conference on Big Data and Computing. (**ICDBC**) 2018

[12] Winoto, P., Cao, V.L., **Tang, E.M.** (2017) A highly customizable parent-child word-learning mobile game for Chinese children with autism, International Conference on Universal Access in Human-Computer Interaction (**HCII**). Springer, Cham, 2017

[13] Dong, G., **Tang, M.**, Cai, L., Barnes, L., Boukhechba, M., Incremental Federated Learning for Mobile Sensing Mental Health Inference, **Under Review**

[14] Dong, G., **Tang, M.**, Yan, R., Cai, L., Mu, Z., Park, B. (2022), Deep Learning for Autonomous Vehicles and Systems, **Book Chapter, River**, 2022

SELECTED RESEARCH PROJECTS

Federated Learning on IoT data. Optimized the accuracy of collaborative training data from IoT edge devices while preserving privacy.

- Designed a dynamic layer importance determination method to select globally important layers for cloud training, while adding differential privacy to the system.

- Experimented with our proposed method on three distinct tasks like energy prediction, HAR, and achieved comparable performance to non-privacy-preserving methods. [SenSys 2022]

SIMS - Social Interactions Monitoring Study. Monitoring social state anxiety with wearable sensors and webcams. [EMBC 2023]

- Preprocessed and extracted 13 linguistic features from a recorded Zoom stream.

- Designed and implemented a novel transfer-learning-like personalization method to identify the state of anxiety of a group of people with high anxiety.

- Experimented and improved the baseline functions (one-size-fits-all, generic ML models) by nearly 28%.

FluiSense. Using multi-modal mobile sensing for better fluid control for end stage kidney disease (ESKD) Patients.
- Conducted a 4-week study and collected time-series data with on-body physiological and behavioral sensors (e.g., PPG, IMU) from ESKD patients. [AHFE 2022]

- Proposed a novel graph neural network-based method to model the multi-modal relationship between sensors. Outperformed 5 selected benchmark models by around 8.7%. [IPSN 2022]

- Proposed a novel graph anomaly detection method to pick fluid overload samples from normal data, improved state-of-the-art baselines by 1.25%.

Graph Unsupervised Representation Learning. A new unsupervised way of graph learning, addressed existing limitations in graph autoencoder, graph structure learning, and infomax-based methods.

- Developed a novel unsupervised graph representation learning method based on autoencoder (AE) and optimal transportation (OT).

- Implemented and experimented with the proposed method on both structural synthetic and mixed real-world datasets [ICLR 2022], improved baselines on structural and mixed types of tasks (-2.98% to 18.48%), and competitive performance on proximity-oriented tasks (-3.21% to-0.32%).

- Implemented and experimented with the baseline monitoring methods of infectious disease via mobile phone records and graph mining. [KDD 2022]

WORK EXPERIENCE

Scientist I - Abbott Neuromodulation   Jan 2023 - Present
Objective: Analysis of neurological data and assess outcome for the next generation of Neuromodulation devices.
Teaching Assistant - Data Science School - University of Virginia   Jan 2021 - Dec. 2022
Objective: DS 5110: Big Data Systems || DS 5100: Programming for Data Science || DS 3002: Data Science Systems.
Data Engineer Intern - Data Strategy Team - Novartis, Inc.   Jun 2020 - Aug 2020
Objective: Construct a comprehensive Biomedical Domain Knowledge Graph based on Wikidata and Ontologies.
AI Engineer Intern - Nanjing Tuobu Intelligent Inc.   Jun 2018 - Aug 2018
Objective: Constructed a face recognition service based on Google FaceNet framework.

HONORS & AWARDS

- **Reviewer**, for Big Data Journal, Conference on Internet of Things Design and Implementation (IoTDI), Computer Science and Application Engineering (CSAE), International Conference on Internet of Things (CIoT).
- **Best Overall Hack** (Rank: 1/70), in Athenahacks 2019, One thumb input method for blind people. 2019
- **Best Senior Project, Outstanding Graduates**, Kean University (Wenzhou) CS department. 2018
- **Outstanding Oral Presentation**, Kean Student Research Day. 2017
- **Dean's List**, Academic, Research and Innovation. 2016, 2017