Jing Liu (Ph.D.)
https://jaymiliu.github.io/JingLiu/

No Sponsorship is needed.

SUMMARY

Actively looking for jobs related to data mining and machine learning. Skilled in data analysis, supervised learning, and deep learning with TensorFlow. Proficient in Pandas, Numpy, Matplotlib, Scikit-learn, and SQL. Equipped with basic knowledge in construction project management and experiences in working with construction companies.

STRENGTHS

Technical Skills: Machine Learning (scikit-learn), Deep Learning (TensorFlow), Graph Neural Network, Pandas, Numpy, Matplotlib
Programming Languages: Python, R, SQL, C#, MATLAB

EDUCATION

- Doctor of Philosophy, Civil Engineering, Jun. 2018
  University of Alberta, Edmonton, Canada
- Master of Engineering, Electronic Engineering, Jun. 2013
  Tsinghua University, Beijing, China
- Bachelor of Engineering, Information Engineering, Jun. 2010
  Southeast University, Nanjing, China

RELATED RESEARCH EXPERIENCE

Research Associate, Deep Learning and Machine Learning Area
Center for Secure Information Systems, George Mason University — Aug. 2018 to Aug. 2019
Advisor: Dr. Noseong Park — *Fairfax, VA, US*

- ***Social media data analysis with Graph Neural Networks (GNN)***
  - Processed both unstructured (e.g., textual data) and structured (e.g., friendship relations and retweet records) social media data
  - Customized a bi-directional long short term memory (LSTM) network to embed tweet texts and integrated it with one state-of-the-art graph convolution neural network for predicting the severity of vulnerabilities
  - Proposed a node-edge co-convolution graph neural network architecture and demonstrated its effectiveness in predicting information diffusion (i.e., influence probability) over social networks
- ***Data augmentation with Generative Adversarial Networks (GAN)***
  - Developed a GAN architecture to synthesize incomplete tabular data with two constraints that are maintaining column-wise statistical means and functional dependencies
  - Improved classification performance with synthesized data and outperformed various state-of-the-art data augmentation approaches
- ***Modeling and accelerating large-scale optimization problems with TensorFlow***
  - Proposed a neural network to model non-linear 0-1 knapsack problem and devised an adaptive gradient ascent method to solve the network
  - Developed deep neural networks to model and maximize airline market share over air transportation network

Research Assistant, Construction Project Scheduling and Management Area
The Hole School of Construction Engineering, University of Alberta — Sep. 2014 to Jul. 2018
Advisor: Dr. Ming Lu — *Edmonton, Canada*

- ***Dual-Level Resource-Constrained Multi-Project Scheduling Framework for Prefabrication in Construction***
  - Proposed a dual-level multi-project scheduling methodology to improve the resource allocation practice of multiple concurrent projects by enhancing the robustness of derived resource plans
  - Implemented the proposed methodology in *IBM ILOG CPLEX Optimization Studio* for proof-of-concept
  - Developed a Microsoft Project addon (in C#) for a partner construction company to apply the proposed methodology in scheduling bridge girder fabrication projects

SELECTED PUBLICATIONS

1. **Jing Liu**, Yudi Chen, Duanshun Li, Noseong Park, Kisung Lee, and Dongwon Lee, "Predicting Influence Probabilities using Graph Convolutional Networks," the 2019 IEEE International Conference on Big Data (IEEE Big Data'19) (Regular paper, acceptance rate 106/550=19.3%)
2. Haipeng Chen, **Jing Liu**, Rui Liu, Noseong Park, and VS Subrahmanian. "VASE: A Twitter-based Vulnerability Analysis and Score Engine." the 19th International Conference on Data Mining (ICDM'19) (Short paper, acceptance rate 194/1046=18.5%)
3. Haipeng Chen, **Jing Liu**, Rui Liu, Noseong Park and V. S. Subrahmanian, "VEST: A System for Vulnerability Exploit Scoring & Timing," the 28th International Joint Conference on Artificial Intelligence (IJCAI'19), demo track
4. Haipeng Chen, Sushil Jajodia, **Jing Liu**, Noseong Park, Vadim Sokolov, and V. S. Subrahmanian, "FakeTables: Using GANs to Generate Functional Dependency Preserving Tables with Bounded Real Data," the 28th International Joint Conference on Artificial Intelligence (IJCAI'19) (Acceptance rate 850/4752=17.9%)
5. **Jing Liu** and Ming Lu (2019) "Synchronized Optimization of Various Management-Function Schedules in a Multi-Project Environment: Case Study of Planning Steel Girder Fabrication Projects in Bridge Construction." *Journal of Construction Engineering and Management* (*accepted, Oct 2019*)
6. **Jing Liu** and Ming Lu (2018) "Robust Dual-Level Optimization Framework for Resource-Constrained Multi-Project Scheduling for a Prefabrication Facility in Construction." *Journal of Computing in Civil Engineering*, 33(2). https://doi.org/10.1061/(ASCE)CP.1943-5487.0000816
7. **Jing Liu** and Ming Lu (2018)"Constraint Programming Approach to Optimizing Project Schedules Under Materials Logistics and Crew Availability Constraints." *Journal of Construction Engineering and Management*, 144(7). 10.1061/(ASCE)CO.1943-7862.0001507
8. **Jing Liu**, Meimanat Soleimanifar, and Ming Lu (2017)"Resource-Loaded Piping Spool Fabrication Scheduling: Material-Supply-Driven Optimization." *Visualization in Engineering*, 5(1), 5. 10.1186/s40327-017-0044-3
9. **Jing Liu** and Ming Lu (2017) "Optimization on Supply-Constrained Module Assembly Process." In: *25th Annual Conference of the International Group for Lean Construction* Heraklion, Greece, 9-12 Jul 2017. pp 813-820. 10.24928/2017/0104
10. **Jing Liu** and Ming Lu (2016)"Proposing A Material-Driven Recovery Schedule Optimization Framework Spool Fabrication Case." *16th International Conference on Computing in Civil and Building Engineering (ICCCBE)*, Osaka, Japan.
11. Ming Lu, **Jing Liu**, and Wenying Ji (2016)"Formalizing A Path-Float-based Approach to Determine and Interpret Total Float in Project Scheduling Analysis." *International Journal of Construction Management*, 1-13. 10.1080/15623599.2016.1207366
12. **Jing Liu**, Fei Qiao, Qi Wei, and Huazhong Yang (2013) "A Novel Video Compression Method Based on Underdetermined Blind Source Separation." *The 7th FTRA International Conference on Multimedia and Ubiquitous Engineering*, Seoul, South Korea. 10.1007/978-94-007-6738-6_2

PATENTS

1. Fei Qiao, **Jing Liu**, Qi Wei, Zhe Wu, and Huazhong Yang "A Novel Video Compression System Based on Underdetermined Blind Source Separation." National Patent of China, CN102413333A.

SELECTED AWARDS

- IJCAI'19 Demonstration Innovation Award Runner-up 2019
- Joseph D Thompson/Zurich Canada Graduate Award 2017
- FGSR Graduate Student Travel Award 2017
- GSA Academic Travel Award 2017

SELECTED TALKS

Invited Talks at Universities and Companies

- Southeast University, Nanjing, China, Jul. 2019
- Supreme Group, Edmonton, Canada, Dec. 2017
- Southeast University, Nanjing, China, Dec. 2015

Presentations at Conferences

- The 28th International Joint Conference on Artificial Intelligence(IJCAI-19), Macao, China, Aug. 2019
- Lean & Computing in Construction Congress (LC3) 2017, Heraklion, Greece, Jul. 2017
- Winter Simulation Conference 2016 (WSC), Arlington, VA, US, Dec. 2016
- The 7th FTRA International Conference on Multimedia and Ubiquitous Engineering, Seoul, South Korea, May 2013

TEACHING EXPERIENCE

Graduate Teaching Assistant, University of Alberta — Fall 2015, 2016

- CIVE 406 - Construction Estimating, Planning, and Control
  Instructor: Ming Lu, Ph.D

Tutor, University of Alberta

- MATH 125 Linear Algebra I
- MATH 225 Linear Algebra II
- MATH 373 Mathematical Programming and Optimization I
- STAT 371 Probability and Stochastic Processes

ACADEMIC SERVICE

- Reviewer, The 2019 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2019)
- Reviewer, Journal of Construction Engineering and Management, ASCE
- Reviewer, Journal of Computing in Civil Engineering, ASCE