Michiharu Yamashita

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Education

Pennsylvania State University — University Park, PA
Ph.D. in Information Science and Technology (Advisor: Prof. Dongwon Lee) — *Aug 2020 – Present*
- Thesis (expected): Advancing the Future of Work: Machine Learning in Job and Human Resource Domain

Tokyo Institute of Technology — Tokyo, Japan
M.Eng. in Computational Intelligence and Systems Science (Advisor: Prof. Kazuo Yano) — *Apr 2015 – Mar 2017*
- **Salutatorian (2nd place in the department)**
- Thesis: Machine Learning for Work Environment Optimization to Improve Well-being through Wearable Sensor

University of Tsukuba — Tsukuba, Japan
B.S. in Management Science and Engineering (Advisor: Prof. Ushio Sumita) — *Apr 2011 – Mar 2015*
- Thesis: Network Analysis and Visualization for Mobile Applications' Competitiveness

Research Experience

PIKE Research Group at Penn State — Aug 2020 – Present
Research Assistant (Advisor: Prof. Dongwon Lee) — *University Park, PA*
- Research Topics: NLP, Recommender Systems, Graph Neural Networks, Adversarial Attack, Computational Job Marketplace
- Developing user-oriented job recommender systems, LLM, and robust/secure models for online job marketplaces.

Megagon Labs — Apr 2017 – Mar 2018
Research Engineer — *Tokyo, Japan*
- Research Topics: NLP, Entity Matching, Entity Extraction
- Developed NLP-specific models and embedded the modules into the company system.

Hitachi Central Research Laboratory / Tokyo Institute of Technology — Apr 2015 – Mar 2017
Research Assistant (Advisor: Prof. Kazuo Yano) — *Tokyo, Japan*
- Research Topic: Network Science, Wearable Sensors, People Analytics
- Developed machine learning models for wearable sensors' data and visualized the sensor data into graph.

Sumita Research Group at University of Tsukuba — Jan 2014 – Mar 2015
Research Assistant (Advisor: Prof. Ushio Sumita) — *Tokyo, Japan*
- Research Topic: Network Analysis, Visualization, Operations Research, Ranking Algorithm
- Developed a competitive score algorithm for app installing with graph embeddings.

Employment Experience

Indeed — May 2022 – Aug 2022
Summer Intern (Data Science and Research) — *Austin, TX (Remote)*
- Developed robust job recommender models to deliver high-quality matches to job seekers and employers.
- Developed a large language model for multiple job-domain downstream tasks.

Freelance — Jun 2019 – Jul 2020
Machine Learning Engineer — *Tokyo, Japan*
- Conducted machine learning projects with a big tech company, a tech startup, and an education startup.
- Developed job mobility prediction models, machine learning models, query optimization tools, etc.

Recruit Holdings — Apr 2017 – Jan 2019
Machine Learning Engineer — *Tokyo, Japan*
- Developed recommendation systems, multi-view click prediction models, and GIS-based applications.
- Developed a pedestrian congestion visualization algorithm using GIS data and OpenStreetMap.
- Developed the geo-topic model to obtain the user interest from POI.

Ohma — Mar 2016 – Mar 2017
Software Engineer (Advisor: Prof. Yutaka Matsuo) — *Tokyo, Japan*
- Developed multiple ML-related systems: network visualization, entity extraction, face recognition, search engine.

Publications

1. Jason Lucas, Adaku Uchendu, **Michiharu Yamashita**, Jooyoung Lee, Shaurya Rohtagi, and Dongwon Lee. Fighting Fire with Fire: The Dual Role of LLMs in Crafting and Detecting Elusive Disinformation. In *Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2023

2. Dominik Macko, Robert Moro, Adaku Uchendu, Jason Lucas, **Michiharu Yamashita**, Matúš Pikuliak, Ivan Srba, Thai Le, Dongwon Lee, Jakub Simko, and Maria Bielikova. MULTITuDE: Large-Scale Multilingual Machine-Generated Text Detection Benchmark. In *Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2023

3. **Michiharu Yamashita**, Jia Tracy Shen, Thanh Tran, Hamoon Ekhtiari, and Dongwon Lee. JAMES: Normalizing Job Titles with Multi-Aspect Graph Embeddings and Reasoning. In *2023 IEEE International Conference on Data Science and Advanced Analytics (DSAA)*. IEEE, 2023

4. Yunqi Li, **Michiharu Yamashita**, Hanxiong Chen, Dongwon Lee, and Yongfeng Zhang. Fairness in Job Recommendation under Quantity Constraints. In *AAAI 2023 Workshop on AI for Web Advertising*, 2023

5. Jingyi Xie*, **Michiharu Yamashita***, Zekun Cai*, and Aiping Xiong. A User Study on the Feasibility of Topic-aware Misinformation Warning on Social Media. In *Proceedings of the Human Factors and Ergonomics Society (HFES)*, 2022

6. **Michiharu Yamashita**, Yunqi Li, Thanh Tran, Yongfeng Zhang, and Dongwon Lee. Looking Further into the Future: Career Pathway Prediction. In *ACM WSDM 2022 Workshop on Computational Jobs Marketplace*, 2022

7. Jia Tracy Shen, **Michiharu Yamashita**, Ethan Prihar, Neil Heffernan, Xintao Wu, Ben Graff, and Dongwon Lee. MathBERT: A Pre-trained Language Model for General NLP Tasks in Mathematics Education. In *NeurIPS 2021 Workshop on Math AI for Education*, 2021 (**Best Paper Award**)

8. Jia Tracy Shen, **Michiharu Yamashita**, Ethan Prihar, Neil Heffernan, Xintao Wu, Sean McGrew, and Dongwon Lee. Classifying Math Knowledge Components via Task-Adaptive Pre-Trained BERT. In *International Conference on Artificial Intelligence in Education (AIED)*, pages 408–419. Springer, 2021

9. **Michiharu Yamashita**, Shota Katsumata, and Yusuke Fukasawa. Discovery of User Preferences from Big Geospatial Data Using Topic Models. In *2018 IEEE International Conference on Big Data (Big Data)*, pages 4387–4392. IEEE, 2018

10. **Michiharu Yamashita**, Hideki Awashima, and Hidekazu Oiwa. A Comparison of Entity Matching Methods between English and Japanese Katakana. In *Proceedings of the Fifteenth Workshop on Computational Research in Phonetics, Phonology, and Morphology at EMNLP*, pages 84–92, 2018

11. Kent Kawai, **Michiharu Yamashita**, and Yutaka Matsuo. Face Recognition System Based on Convolutional Neural Network Robust to Occlusion and Low Quality Images. In *The 31st Annual Conference of the Japanese Society for Artificial Intelligence*, pages 3M21–3M21. JSAI, 2017

12. **Michiharu Yamashita**, Nobuo Sato, and Kazuo Yano. Enhancing Collective Happiness by Controlling Room Temperature Using Big Data from Wearable Sensors. In *The 2016 IEICE General Conference*, volume 115, pages 31–34. IEICE, 2016

Industrial Projects

BigGorilla (Open-source Components for Data Integration) Apr 2017 – Mar 2018
Megagon Labs *Tokyo, Japan*

- Developed an entity matching and entity extraction module and NLP related frameworks.
- Applied NLP modules into the companies and promoted open-source components BigGorilla.

Spysee2 (People Search Engine) Mar 2016 – Mar 2017
Ohma, Inc. *Tokyo, Japan*

- Developed a network visualization search engine SPYSEE2 which had 1M+ visits per month.
- Developed entity extraction, entity linking, and face recognition systems from unstructured and noisy web data.
- Crawled millions of web pages efficiently using programs on AWS.

Mobile App Competitiveness Visualization Apr 2014 – Mar 2015
Fuller, Inc. *Tsukuba, Japan*

- Developed a ranking algorithm for mobile app competitive analysis.
- Developed a network visualization using app downloading flow.

Honors and Awards

2023 Student Volunteer Program at EMNLP 2023
2023 IEEE CIS Travel Grant for DSAA 2023
2021 Best Paper Award at NeurIPS 2021 Workshop on Math AI for Education
2020 Funds for Excellence in Graduate Recruitment Scholarships from Penn State
2018 Recruit Holdings The Best Freshman Award 2018
2018 Recruit Holdings R&D MVP Award 2017
2017 Full Repayment Exemption of Graduate Student Loan $20,000 for Excellent Achievement
2017 Salutatorian at Tokyo Institute of Technology
2017 The Second Best Master Thesis Award from Tokyo Institute of Technology
2015-2017 Full Tuition Exemption from Tokyo Institute of Technology
2011-2015 Full Tuition Exemption from University of Tsukuba

Technical Skills

Languages: Python, Java, C/C++, SQL, Swift, R, JavaScript, HTML/CSS
Frameworks: Tensorflow, Keras, PyTorch, Flask, Elasticsearch
Developer Tools: Docker, Google Cloud Platform, AWS, SageMaker