Ryo Yuki

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IbarakikenYukishi
https://ibarakikenyukishi.github.io/index-e.html

PERSONAL STATEMENT

I am a Machine Learning Expert with five years of combined research and work experience. I got the Ph.D. degree at the Department of Mathematical Informatics at the University of Tokyo. My research topics include X-ray computed tomography, change detection, and graph mining. I have a strong sense of responsibility and good communication skills, both of which have been cultivated by my experiences as a team leader. I also have much programming experience through developing time-series analysis software and study of machine learning.

EDUCATION

Ph.D. in Information Science and Technology Mar. 2024
The University of Tokyo Tokyo
Faculty Mentor: Professor Kenji Yamanishi
Dissertation: An Information-Theoretic Study on Dimensionality Selection and Similarity Optimization for Graph Embedding.

M.E. in Information Science and Technology Mar. 2021
The University of Tokyo Tokyo
Faculty Mentor: Professor Kenji Yamanishi
Dissertation: Change Sign Detection with Two-Stage MDL Change Statistics.

B.E. in Precision Engineering Mar. 2019
The University of Tokyo Tokyo
Faculty Mentor: Associate Professor Yutaka Ohtake
Dissertation: A Machine Learning Approach for Fast X-ray Computed Tomography Scan by Deblurring Transmission Images (in Japanese).

KEY SKILLS

Machine Learning Knowledge: Advanced
Mathematics: The Statistical Certification, Grade 1 (in Japan) and Mathematics Certification Level 1st (in Japan).
Python,C,C++: Advanced
Java,Ruby,HTML and CSS: Beginner
Git: Advanced
Unix Commands: Advanced
Arduino,CAD: Intermediate
Languages: HSK V 204 pts and HSKK Beginner (Chinese)

RESEARCH EXPERIENCE

Learning Sparse Representation of Graph Embedding with General Similarities using GroupLasso and Luckiness Normalized Maximum Likelihood Code-Length Mar. 2023 - Mar. 2024
Faculty Mentor: Professor Kenji Yamanishi

- Research Topic: dimensionality selection of graph embedding with the weighted inner product similarity (WIPS) using GroupLasso and luckiness normalized maximum likelihood (LNML) code-length. WIPS is a model-selection-free graph embedding method, and we perform dimensionality selection by selecting the optimal regularization coefficients of GroupLasso using the LNML code-length.
- Submitted to the neural networks journal.

Dimensionality and Curvature Selection of Graph Embedding using Decomposed Normalized Maximum Likelihood Code-Length Mar. 2023 - Jul. 2023
Faculty Mentor: Professor Kenji Yamanishi

- Research Topic: dimensionality and space selection of graph embedding using decomposed normalized maximum likelihood (DNML) code-length, which is a customization of the minimum description length (MDL) principle. The candidates for embedding spaces are hyperbolic, Euclidean, and spherical ones, all of which have constant curvature. Thus, the space selection is reduced to the curvature selection.
- Accepted for publication in 23rd international conference on data mining (ICDM2023).

Dimensionality Selection of Hyperbolic Graph Embeddings using Decomposed Normalized Maximum Likelihood Code-Length Apr. 2021 - Feb. 2023
Faculty Mentor: Professor Kenji Yamanishi

- Research Topic: dimensionality selection of hyperbolic graph embeddings using DNML code length. Previous work of the study in ICDM 2023.
- Accepted for publication in 22nd international conference on data mining (ICDM2022).
- Its extended version was accepted for publication in Knowledge and Information Systems (KAIS), 2023.

Change Sign Detection with Two-Stage MDL Change Statistics Apr. 2019 - Mar. 2021
Faculty Mentor: Professor Kenji Yamanishi

- Master's study, dissertation.
- Research Topic: detection of change signs in data streams by two-stage change detection approach.

Change Sign Detection with Differential MDL Change Statistics and its Applications to COVID-19 Pandemic Analysis Feb. 2020 - Jul. 2020

- Research Topic: detection of change signs in data streams using differential information of change scores and applications to COVID-19 pandemic analysis.
- Accepted for publication in Scientific Reports, 2021.
- Implemented an online alerting system for COVID-19 pandemic analysis. (link)

A Machine Learning Approach for Fast X-ray Computed Tomography Scan by Deblurring Transmission Images
Apr. 2018 - Mar. 2019
Faculty Mentor: Professor Yutaka Ohtake

- Bachelor's study, dissertation.
- Research Topic: acceleration of precise CT scan by deblurring transmission images using convolutional neural networks.
- Accepted for publication in 10th international conference on industrial computed tomograpby 2020 (iCT2020).
- Its extended version was accepted for publication in Precision Engineering, 2021.

INTERNSHIP EXPERIENCE

DEVELOPER Sep. 2018 - present
pluszero Inc. Tokyo

- Developed an automatic electricity consumption prediction system for a company with AWS sagemaker. Managed the development flow as a team leader and implemented the machine learning system in Python as a developer. Improved the accuracy and time efficiency of prediction.
- Developed a time-series analysis software for one of the biological laboratories at the university of Tokyo. Managed the development flow as a team leader and implemented the system in Python. The processing time for each data sequence was shortened from 100 minutes to 5 minutes with the developed software, which improved the efficiency of biological research.
- Developing an autonomous time-series analysis software for a company, which is motivated by "AutoML", a machine learning library that chooses suitable machine learning methods and adjusts the hyperparameters automatically. Investigated time-series algorithms proposed in previous studies, assigned their implementation to team members, and implemented 5 algorithms from scratch.

DEVELOPER Aug. 2021 - Sep. 2021
Preferred Networks Inc. Tokyo

- Worked on change detection and its variable selection in multivariate time-series data (link).
- Investigated and implemented *additive Hilbert-Schmidt independence criterion* (aHSIC, Yamada et al., 2013), which is based on the kernel method and Lasso (Tibshirani, 1996 and 2011).
- Implemented the following improvements to the algorithm: (1) searching for multiple points in a window, (2) extension of aHSIC to handle changes that gradually occur, and (3) automatic selection of the regularization factor λ.
- Improved the performance of the method in terms of area under the curve (AUC) and mean average precision (MAP).

DEVELOPER Aug. 2019 - Sep. 2019
Wantedly Inc. Tokyo

- Improved the recommendation system of Wantedly Visit, a website that recommends job applicants to companies and vice versa.
- Implemented an autonomous detection system of anomalous users and companies that try to boost their recommendation ranking of recruitments intentionally by automatic accessing. Implemented the system in Python.

TEACHING EXPERIENCE

Tutor of International Students (Language Support) Sep. 2019 - Mar. 2020
The University of Tokyo Tokyo

Teaching Assistant of Advanced Core in Probability (Measure-theoretic Probability Theory) Sep. 2020 - Mar. 2021
The University of Tokyo Tokyo

SCHOLARSHIPS&FELLOWSHIP

Shinnihon Scholarship Apr. 2017 - Mar. 2021
5 people with a high GPA at the university of Tokyo 6,400USD/year
Hayashi Rheology Scholarship Apr. 2018 - Mar. 2021
4 people with a high GPA at the university of Tokyo 5,500USD/year
Satomi Scholarship Apr. 2017 - Mar. 2019
10 people with a high GPA at the university of Tokyo 5,500USD/year
Furukawa Scholarship Apr. 2017 - Mar. 2023
1 person with a high GPA at the university of Tokyo 3,300USD/year
Nikki-Saneyoshi Scholarship Apr. 2016 - Mar. 2017
14 people with a high GPA at the university of Tokyo 2,800USD/year
International Graduate Program of Innovation for Intelligent World Fellowship Sep. 2021 - Mar. 2023
15 people out of 26 applicants 16,000USD/year
Japan Society for the Promotion of Science Fellowship Apr. 2023 - Mar. 2024
12 people out of 61 applicants 18,000USD/year
Ando Foundation Scholarship Apr. 2023 - Mar. 2024
2 people with a high GPA at the university of Tokyo 66,00USD/year

AWARDS

English Presentation, Best Overall, The University of Tokyo Jul. 2018
AI RUSH 2nd Place out of 100 Participants Aug. 2019
Excellent Student Award in the "Chinese Bridge" Online Program, Zhejiang University Feb. 2022

VOLUNTEER & OVERSEAS EXPERIENCE

Volunteer Leader of the Department of Precision Engineering at University's May Festival Sep. 2016 - May. 2018
The University of Tokyo Tokyo

- Managed a project that focuses on programming and mathematics related to engineering as a team leader of 50 members.
- Main projects: VR games, autonomous cocktail makers, projection mappings, and preferable hairstyle suggestor.

Cyber Summer Camp for Chinese Language and Culture (two weeks) Sep. 2020
Sichuan Normal University Sichuan

"Chinese Bridge" Online Program (two weeks) Feb. 2022
Zhejiang University Zhejiang

PUBLICATIONS[Refereed]

Yuki, R., Suzuki, A., & Yamanishi, K. (2023). Dimensionality and curvature selection of graph embedding using decomposed normalized maximum likelihood code-length. *accepted for presentation at ICDM2023* (short paper).

Yuki, R., Ike, Y. & Yamanishi, K. (2023). Dimensionality selection for hyperbolic embeddings using decomposed normalized maximum likelihood code-length. Knowledge and Information Systems. https://doi.org/10.1007/s10115-023-01934-2

Yuki, R., Ike, Y., & Yamanishi, K. (2022). Dimensionality selection of hyperbolic graph embeddings using decomposed normalized maximum likelihood code-length. *accepted for presentation at ICDM2022* (regular paper).

Yamanishi, K., Xu, L., **Yuki, R.**, Fukushima, S., & Lin, C. H. (2021). Change sign detection with differential MDL change statistics and its applications to COVID-19 pandemic analysis. *Scientific reports*, 11(1), 1-15.

Yuki, R., Ohtake, Y., & Suzuki, H. (2022). Acceleration of X-ray computed tomography scanning with high-quality reconstructed volume by deblurring transmission images using convolutional neural networks. *Precision Engineering*, 73, 153-165.

Yuki, R., Ohtake, Y., & Suzuki, H. (2020). Deblurring X-ray transmission images using convolutional neural networks to achieve fast CT scanning. *The 10th international conference on industrial computed tomography (iCT2020),* Wels, Austria, Feb. 2020. (full paper)

PUBLICATIONS[Preprint]

Yuki, R., Akiyama, S., Suzuki, A., & Yamanishi, K. (2023). Learning Sparse Representation of Graph Embedding with General Similarities using GroupLasso and Luckiness Normalized Maximum Likelihood Code-Length. Available at SSRN 4663084.