李鸿敏 **(Li Hongmin)**
Post-Doctoral Researcher, University of Tokyo
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Personal Statement

As a passionate researcher specialized in Spectral Clustering, Optimization, and Machine Learning, my career is marked by significant contributions to large-scale spectral clustering algorithms. Looking forward, I aim to apply my expertise to bioinformatics and broader AI technology applications, striving to make meaningful contributions wherever my skills can have the most impact.

Current Position

- **Post-Doctoral Researcher,** Asai Laboratory, Department of Computational Biology, Graduate School of Frontier Sciences, University of Tokyo

Education

- **Ph.D. in Computer Science (Information Systems Engineering),** University of Tsukuba (Apr 2019 - Mar 2022)
- **Master's in Computer Science (Information Systems Engineering),** University of Tsukuba (Apr 2017 - Mar 2019)
- **Bachelor's in Electronic Information Engineering,** Ningxia University (Sep 2011 - Jul 2015)

Academic Positions and Work Experience

- **Postdoctoral Researcher,** The University of Tokyo (May 2023 - Present)
- **Machine Learning Engineer (蓝色空间领航者/Young Talent Program),** Haomo.AI Technology Co., Ltd., Beijing, China (Oct 2022 - May 2023)
- **Postdoctoral Researcher,** The University of Tokyo (Apr 2022 - Mar 2023)
- **Research Assistant,** University of Tsukuba, Center for Artificial Intelligence Research (May 2019 - Apr 2021)
    - Employed in the Department of Information Systems and the Computer Science Program.
- **Graduate Teaching Assistant,** University of Tsukuba (Sep 2019 - Dec 2019)
- **Short Term Research Assistant,** University of Tsukuba, Computer Science Program (Oct 2018 - Apr 2019)
- **Machine Learning Engineer Intern,** HAOMO.AI, Beijing, China (Jul 2021 - Sep 2021)
- **Undergraduate Teaching Assistant,** University of Tsukuba (Apr 2018 - Jun 2018)
    - Assisted in the course of Information Science for Undergraduate students.

Detailed Research Experience

Postdoctoral Research at University of Tokyo

- Focused on applying LLM technologies to RNA data for RNA design.
- Engaged in predictive modeling on mRNA degradation and understanding RNA family data using multimodal language models.

Publications

Journal Papers:

1. ***Hongmin Li***, Xiucai Ye, Akira Imakura, Tetsuya Sakurai. "LSEC: Large-scale spectral ensemble clustering." Intelligent Data Analysis, vol. 27, no. 1, pp. 59-77, 2023.
2. ***Hongmin Li***, Xiucai Ye, Akira Imakura, Tetsuya Sakurai. "Divide-and-conquer based large-scale spectral clustering." Neurocomputing, vol. 501, pp. 664-678, 2022.
3. Meng Huang, Xiucai Ye, ***Hongmin Li***, Tetsuya Sakurai. "Missing Value Imputation With Low-Rank Matrix Completion in Single-Cell RNA-Seq Data by Considering Cell Heterogeneity." Frontiers in Genetics, vol. 13, 952649, 2022.
4. Xiucai Ye, ***Hongmin Li***, Akira Imakura, Tetsuya Sakurai. "An oversampling framework for imbalanced classification based on Laplacian eigenmaps." Neurocomputing, vol. 399, pp. 107-116, 2020.
5. Xiucai Ye, ***Hongmin Li***, Tetsuya Sakurai, Pei-Wei Shueng. "Ensemble feature learning to identify risk factors for predicting secondary cancer." International Journal of Medical Sciences, vol. 16, no. 7, pp. 949, 2019.

Conference Papers (All presentations were oral):

1. ***Hongmin Li***, Xiucai Ye, Akira Imakura, Tetsuya Sakurai. "Ensemble learning for spectral clustering." In Proceedings of the 2020 IEEE International Conference on Data Mining (ICDM), pp. 1094-1099, 2020.
2. ***Hongmin Li***, Xiucai Ye, Akira Imakura, Tetsuya Sakurai. "Hubness-based sampling method for Nyström spectral clustering." In Proceedings of the 2020 International Joint Conference on Neural Networks (IJCNN), pp. 1-8, 2020.
3. Xiucai Ye, ***Hongmin Li***, Akira Imakura, Tetsuya Sakurai. "Distributed Collaborative Feature Selection Based on Intermediate Representation." In Proceedings of IJCAI, pp. 4142-4149, 2019.
4. Xiucai Ye, ***Hongmin Li***, Tetsuya Sakurai, Zhi Liu. "Large scale spectral clustering using sparse representation based on hubness." In Proceedings of the 2018 IEEE SmartWorld, pp. 1731-1737, 2018.

Presentations

1. "RNA-language pre-training model," oral presentation at RNAインフォマティクス道場2023, held from August 17, 2023, 1:00 PM to August 23, 2023, 5:00 PM at Kobe Bay Sheraton Hotel & Towers, Maya (Main Building 3F), Kobe, Japan.
2. "Fast dimensionality reduction for RNA," oral presentation at RNAインフォマティクス道場2022, held from August 24, 2022, 9:00 AM to August 28, 2022, 6:00 PM at Phoenix Seagaia Resort, Seagaia Convention Center, Miyazaki City, Japan.
3. "LSEC: large-scale spectral ensemble clustering," poster presentation at the Support for Pioneering Research Initiated by the Next Generation Recipients (SPRING Fellowship), March 2022, Tsukuba City, Japan.
4. "A novel large scale spectral clustering," oral presentation at The 2021 International Collaborative Workshop of RUB-UGA-UT, 3rd Edition - Recent Trends in Computer Science and Artificial Intelligence (CollaboTICS 2021), a collaborative workshop between the

University of Grenoble-Alpes, Ruhr-Universität Bochum, and the University of Tsukuba, held on December 15-16, 2021. Japan time: 4 pm to 9 pm; France and German time: 8 am to 1 pm.

5. "Large scale spectral clustering using landmarks based on hubness," oral presentation at the International Symposium on “Digital Science Now” in association with the G20 Ministerial Meeting on Trade and Digital Economy, June 7, 2019, at University Hall, University of Tsukuba (Tsukuba Campus), 3-1 Amakubo, Tsukuba, Ibaraki, Japan.

Skills and Techniques

- Skilled in Python, MATLAB, and R.
- Experienced in using supercomputer clusters for high-performance computing.
- Skilled in machine learning and deep learning methodologies.

Awards

- JST Support for Support for Pioneering Research Initiated by the Next Generation, Oct 2021.
- Second Prize in AETA Earthquake Prediction AI Algorithm Competition, Oct 2020.
- Special Award in 3rd Analysys International Algorithm Competition - PV, UV Prediction Competition, Oct 2019.
- Best Paper Award at CBDCom for "Large Scale Spectral Clustering Using Sparse Representation Based on Hubness", Aug 2019.