SINA TABAKHI

stabakhi1@sheffield.ac.uk | sinatabakhi.github.io | GitHub | Google Scholar | LinkedIn

Summary

Passionate PhD student at the University of Sheffield, interested in multimodal learning for multiomics, graph neural networks, knowledge graphs, and dimensionality reduction through feature selection. Motivated by developing machine learning and deep learning algorithms to address real-world challenges.

Education

- **PhD in Computer Science**, University of Sheffield, Sheffield, UK. Nov 2021 - present
  Thesis: Leveraging graph neural networks for multimodal learning in multiomics.
  Supervisor: Professor Haiping Lu.
- **MSc in Computer Engineering**, University of Kurdistan, Sanandaj, Iran. Sep 2011 - Oct 2013
  Thesis: New feature selection methods based on filter approach using ant colony optimization algorithm.
  GPA: 19.45/20 (4.0/4.0); ***Rank***: 1/20.
- **BSc in IT Engineering**, Azad University, Sanandaj, Iran. Sep 2007 - Sep 2011
  GPA: 18.41/20 (3.92/4.0); ***Rank***: 1/80.

Publications

Journal Papers

1. **S. Tabakhi**, C. Vandermeulen, I. Sudbery, and H. Lu, "Heterogeneous Graph Attention Network With Joint Feature Selection for Cancer Multiomics Integration", *IEEE Transactions on Neural Networks and Learning Systems*, 2024, [Under review].
2. P. Tripathi, **S. Tabakhi**, M. N. Suvon, L. Schöb, S. Alabed, A. Swift, S. Zhou, and H. Lu, "Interpretable Multimodal Learning for Cardiovascular Hemodynamics Assessment", *IEEE Transactions on Medical Imaging*, 2024, [Under revision].
3. **S. Tabakhi**, M. N. Suvon, P. Ahadian, and H. Lu, "Multimodal Learning for Multi-Omics: A Survey", *World Scientific Annual Review of Artificial Intelligence*, 1, 2250004, 2023.
4. **S. Tabakhi** and P. Moradi, "Universal Feature Selection Tool (UniFeat): An Open-Source Tool for Dimensionality Reduction", *Neurocomputing* (**IF: 5.5**), 535, 156-165, 2023.
5. **S. Tabakhi** and P. Moradi, "Relevance–Redundancy Feature Selection based on Ant Colony Optimization", *Pattern Recognition* (**IF: 7.5**), 48, 2798-2811, 2015, (**208 citations**, Dec 2024).
6. **S. Tabakhi**, A. Najafi, R. Ranjbar, and P. Moradi, "Gene Selection for Microarray Data Classification Using a Novel Ant Colony Optimization", *Neurocomputing* (**IF: 5.5**), 168, 1024-1036, 2015, (**181 citations**, Dec 2024).
7. **S. Tabakhi**, P. Moradi, and F. Akhlaghian, "An Unsupervised Feature Selection Algorithm based on Ant Colony Optimization", *Engineering Applications of Artificial Intelligence* (**IF: 7.5**), 32, 112-123, 2014, (**477 citations**, Dec 2024).

Conference Paper

1. **S. Tabakhi** and H. Lu, "Multi-agent Feature Selection for Integrative Multi-omics Analysis", 44^{th} *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Glasgow, UK, 1638-1642, 2022.

Honors and Awards

- **Best Pitch Award**, First Workshop on Multimodal AI, Sheffield, UK, 2023.
- **Runner Up Prize**, Open Research Prize 2023, University of Sheffield, UK, 2023.
- **Best PGR ORCiD Profile Prize**, PGR ORCiD Profile Competition 2023, University of Sheffield, UK, 2023.
- **University Research Scholarship**, University of Sheffield, UK, 2021-2025.
- **Top 5 Most Cited Papers** in Last 5 Years, Engineering Applications of Artificial Intelligence (Elsevier), 2019.
- **Outstanding Contribution in Reviewing** certificate, Pattern Recognition (Elsevier), 2018.
- **Ranked** 1^{st} among 20 students, Department of Computer Engineering, University of Kurdistan, Iran, 2013.
- **Ranked** 1^{st} among 80 students, Department of Computer Engineering and IT, Azad University, Iran, 2011.
- **Honorable Mention** in the Asia Regional ACM Programming Contest, Tehran Site, Sharif University of Technology, Iran, 2008, 2009, and 2010.
- **Ranked** 1^{st} in Internal ACM Programming Contest, Azad University, Iran, 2008 and 2009.

Work Experience

- **Software Engineer** (part-time), University of Sheffield, Sheffield, UK. Jan 2022 – Oct 2023
  - Developed the Sheffield Data Science and AI Community website (https://shef-ai.github.io/).
- **Senior Backend Developer**, Phoenix, Tehran, Iran. Dec 2019 – Oct 2021
  - Developed a crowdfunding platform using .Net Core, CQRS, Entity Framework, event sourcing, and SQL Server.
  - Designed unit tests to cover 30% of the code.
  - Refactored and maintained legacy code for the back-office project.
  - Collaborated with front-end developers, infrastructure teams, and support staff to enhance project execution.
- **Senior Backend Developer**, AloPeyk, Tehran, Iran. May 2019 – Nov 2019
  - Developed micro-services based on .Net Core, Entity Framework, and MySQL for the AloMarket project.
  - Implemented unit and integration tests, achieving 50% code coverage.
  - Contributed to development meetings and architectural design discussions with the development team.
- **Web Application Developer**, Jiro Software Engineering Co., Sanandaj, Iran. Jan 2017 – May 2019
  - Contributed to academic software development, addressing bugs, and implementing data visualization features.
  - Worked with ASP.Net, C#, and SQL server.
  - Employed DevExpress and Stimulsoft tools for data visualization.
- **Research Assistant**, University of Kurdistan, Sanandaj, Iran. Jun 2015 – Apr 2016
  - Explored numerous state-of-the-art feature selection methods and implemented them in a Java-based package.

Teaching Experience

- **Graduate Teaching Assistant**, Scalable Machine Learning, University of Sheffield, UK. Spring 2023-2024
  - Leveraged Apache Spark (PySpark) for large-scale machine learning on the university's High-Performance Computing (HPC) cluster systems.
- **Instructor**, Design and Analysis of Algorithms, University of Kurdistan, Iran. Fall 2015
- **Instructor**, Data Structures, University of Kurdistan, Iran. Spring 2015

Selected Research Projects

- **Universal Feature Selection Tool (UniFeat)** (https://unifeat.github.io/) with Parham Moradi
  - Developed an open-source tool in Java, incorporating 30 feature selection methods.
  - Implemented auxiliary tools for performance evaluation, visual displays, and statistical analysis.
  - Created comprehensive end-user documentation, including installation instructions and use case examples.
  - Provided detailed API documentation and tutorials for developers to facilitate software extension.
- **Knowledge-Aware machine LEarning library (PyKale)** (https://pykale.github.io/) with the PyKale team
  - Contributed to the library, focusing on multimodal learning to enhance machine learning accessibility.
  - Developed a multiomics integration method for cancer classification tasks.
  - Designed unit and integration tests that increased the code coverage of the library.
  - Contributed to developing API documentation and instructional examples.

Professional Services

- **Reviewer** in Learning on Graphs Conference. 2024
- **Reviewer** in IEEE Transactions on Neural Networks and Learning Systems. since 2023
- **Reviewer** in Pattern Recognition (Elsevier). 2017-2018, since 2023
- **Reviewer** in Neural Computing and Applications (Springer). since 2023
- **Reviewer** in IEEE International Symposium on Biomedical Imaging (ISBI). 2023
- **Organizer** of the First and Second Workshop on Multimodal AI, Sheffield, UK. 2023 & 2024
- **Co-organizer** of the Alan Turing Institute's interest group on Meta-learning for multimodal data. since 2022
- **Contributor** to the development of Sheffield Data Science and AI Network with the support of the Turing Network Development Award. since 2022

Talks and Posters

- "From Multimodal Learning to Graph Neural Networks", *First Workshop on Multimodal AI*, Sheffield, UK, June 2023.
- "Multi-agent Feature Selection for Integrative Multi-omics Analysis", *N8 CIR Machine Learning Theme Launch*, University of Leeds, UK, November 2022.
- "Multi-agent Feature Selection for Integrative Multi-omics Analysis", 44^{th} *Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Glasgow, UK, July 2022.
- "Multimodal Learning for Multi-omics", *Machine Learning Research Retreat*, University of Sheffield, UK, July 2022.

Memberships

- The Alan Turing Institute, London, UK. since 2022
- Insigneo Institute (Interdisciplinary research center revolutionizing healthcare technology), Sheffield, UK. since 2023
- IEEE Student Membership. since 2012
- IEEE Engineering in Medicine and Biology Society Membership. since 2022

Technical Skills

- **Programming Languages**: - Experienced in Python, C#. - Worked with Java, C/C++.
- **Frameworks**: - Worked with PyG, PyTorch, NumPy, Pandas, Scikit-learn, Lightning, Matplotlib.
- **Web Programming**: - Experienced in ASP.NET. - Familiar with HTML, CSS, Javascript.
- **Databases**: - Experienced in SQL server. - Worked with MySQL.
- **IDE**: - Microsoft Visual Studio, PyCharm, NetBeans, Eclipse.
- **Version Controls**: - Git.