Solmaz Seyed Monir
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LinkedIn | CV | Google Scholar | GitHub
University of Washington

Summary

Ph.D. student in the **Database Research Group** at the University of Washington, specializing in multi-vector search algorithms, high-dimensional data indexing, and scalable machine learning. Experienced in supervised and unsupervised learning, with a focus on information retrieval and high-performance computing. Proficient in Python, data science, and scalable data management. As a Full Stack Developer, I bridge research with practical applications through expertise in backend and frontend technologies.

Education

University of Washington, WA
Ph.D. Student in Computer Science and Systems (September 2021 – Present)
Advisors: Dr. Juhua Hu (2022–2023), Dr. Dongfang Zhao (2023–Present)
M.S. in Computer Science (September 2021 – June 2023)
Relevant Coursework: Algorithms, Big Data Analytics, Software Engineering for Cloud Computing, Internet of Things, Bioinformatics, Advanced Machine Learning, Research in Distributed Systems, Spatial Data and GIS, Master's Seminar in Computer Science and Systems.

Illinois Institute of Technology, Chicago, IL (2019)
M.S. in Information Technology Infrastructure
GPA: 4.0/4.0

Azad University
M.S. in Computer Information Systems (Data Science)
Master's Thesis: Novel Modeling for Enhanced Customer Value Optimization in Contact Centers

University of Science and Culture
B.E. in Computer Software Engineering

Research Experience

Graduate Research Assistant - Vector Databases 2023 – Present
University of Washington, Database Group
Advisor: Dr. Dongfang Zhao

- **Current Research:** Advanced indexing and search techniques for high-dimensional data.
- **Research Project:** VectorSearch – Enhancing document retrieval with semantic embeddings and optimized search strategies.
- Research on vector databases for large language models to improve document retrieval efficiency.
- Semi-supervised learning and dimensionality reduction techniques for enhanced data analysis.
- Applied advanced machine learning models for robust fake news detection.

The Center for Data Science – Computer Vision and ML 2022 – 2023
University of Washington
Advisor: Dr. Juhua Hu

- Applied CNNs, deep learning, and HDBSCAN for predictive modeling in natural convection systems.
- Developed novel methods for chaotic transition prediction using unsupervised ML and deep neural networks.
- Extensive testing using hierarchical density-based spatial clustering (HDBSCAN).
- Used AWS to optimize performance in cloud-based distributed systems.

Reviewer Experience

- Reviewer for ACM Web Conference 2025 (The Web Conference, formerly WWW)
- Reviewer for IPDPS 2025 (IEEE International Parallel & Distributed Processing Symposium)
- Reviewer for ICDCS 2025 (IEEE International Conference on Distributed Computing Systems)
- Reviewer for CIKM Conference 2024 (ACM International Conference on Information and Knowledge Management)
- Reviewer for Journal of Big Data (2024–2025)

Publications & Conference Papers

- **Solmaz Seyed Monir**, D. Zhao, *NexusIndex: Integrating Advanced Vector Indexing and Multi-Model Embeddings for Robust Fake News Detection.* arXiv:2410.18294, Oct 2024.
- **Solmaz Seyed Monir**, I. Lau, S. Yang, D. Zhao, *VectorSearch: Enhancing Document Retrieval with Semantic Embeddings and Optimized Search.* arXiv:2409.17383, 2024.
- **S. Seyed Monir**, D. Zhao, *VecLSTM: Trajectory Data Processing and Management for Activity Recognition through LSTM Vectorization and Database Integration.* arXiv:2409.19258, 2024.
- **S. Seyed Monir** and D. Zhao, "Efficient Feature Extraction for Image Analysis through Adaptive Caching in Vector Databases," in *Proc. of ICICT 2024*, Honolulu, HI, USA, pp. 193–198. DOI:10.1109/ICICT62343.2024.00036.
- **S. Seyed Monir**, J. Hu, B. Tribelhorn, and H. E. Dillon, "Enhanced Chaotic Transition Prediction Using Hierarchical Clustering for the Lorenz System," in *Proc. of ASME IMECE 2023*, New Orleans, LA, vol. 87677, p. V010T11A065. ASME Digital Collection.

Presentations

- "Efficient Feature Extraction for Image Analysis through Adaptive Caching in Vector Databases", presented at ICICT 2024.
- "Enhanced Chaotic Transition Prediction Using Hierarchical Clustering for the Lorenz System", poster at UW Research Showcase 2023 and ASME IMECE 2023.
- University of Washington Research Showcase (Lightning Talks and Posters):
  - Efficient Feature Extraction for Image Analysis through Adaptive Caching (2024)
  - Efficient Trajectory Data Processing via LSTM Vectorization (2024)
  - Enhanced Chaotic Transition Prediction with Hierarchical Clustering (2023)

Projects

- Developed a static portfolio site using HTML, CSS, and JavaScript. Portfolio Site
- Created a React application for location-specific weather information. Weather App
- Led a data center build project for Alpha Vertical, Inc using Cisco Nexus switches and firewall technology (2018-2019).
- Implemented a database and user interface for an insurance company to manage claims in Java and MySQL (2018-2019).

Teaching Experience

Lecturer — North Seattle College - Department of Math & Science
September 2023 - Present
Seattle, WA

- CSC 110: Python Programming

Lecturer — Central Washington University - Department of CS
September 2022 - 2023
Ellensburg, WA & Des Moines, WA

- CS380: Software Engineering (Java and Project Management)
- CS470: Operating Systems (Online - C, C++, and Linux)

Teacher — Yellow Wood Academy
September 2023 - June 2023
Mercer Island, WA

- Taught high school students computer science and 3D design.

Instructor — Lavner Education
April 2022 - August 2022
Seattle, WA

- Taught Python programming and game design.

Professional Experience

Full Stack Developer — InstaHub
October 2021 - April 2022 (remote) Philadelphia, PA

- Designed and modified websites for user-friendly design and analytics in energy management systems.
- Set up REST API, database, and AWS cloud infrastructure.

Full Stack Developer — SIERRA CONSULTING
April 2020 - August 2020 Chicago, IL

- Led a project developing a login and CRUD application using Java, Angular, and MySQL.

Skills

- **Programming Languages:** Python, Java, C++, CSS3, HTML5, JavaScript, TypeScript, SQL, NoSQL, Shell Scripting
- **Technologies:** React, Angular, Spring Boot, JDBC, JavaFX, J2EE, Flask, Django, Node.js, Bootstrap, Tailwind CSS
- **Tools:** NumPy, SciPy, Pandas, PyTorch, TensorFlow, Keras, Scikit-learn, HDBSCAN, OpenCV, Kubernetes, Spark, Matplotlib, Plotly
- **Cloud Services:** AWS EC2, VPC, S3, RDS, Lambda, SageMaker, CloudFormation, Google Cloud Platform, Microsoft Azure
- **Database Management:** Microsoft SQL Server, MySQL, PostgreSQL, MongoDB, Cassandra, Redis, Elasticsearch
- **Other:** Machine Learning, Deep Learning, Natural Language Processing (NLP), Data Analysis, Big Data Analytics, Computer Vision, High-Performance Computing, Linux

Certifications

- EMC Academic Associate, Information Storage, and Management (2019)
- IPv6 Certification Explorer (2018)
- Networking (Udemy, 2019)
- Web Developer in 2020 with HTML, CSS, JavaScript, React, Node.js, Machine Learning & more! (Udemy, 2019)
- AWS Solutions Architect - Associate (Udemy)

Honors & Awards

- Conference and Training Fund (CTF) Award for presenting at ICICT 2024 *Paper: Efficient Feature Extraction for Image Analysis through Adaptive Caching in Vector Databases*
- Conference and Training Fund (CTF) Award for presenting at ASME IMECE 2023 *Paper: Enhanced Chaotic Transition Prediction Using Hierarchical Clustering for the Lorenz System*
- Alpha Kappa Alpha Educational Advancement Foundation Graduate Merit Scholarship (2021)