# Amir Hassan Shariatmadari

**Software and Machine Learning Engineer**

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## Profile

Versatile software and machine learning engineer with expertise in ML systems, backend infrastructure, and cloud-native applications. Proven experience building large-scale data processing pipelines concurrent programming and data parallelism, deploying production ML services, and training novel machine learning models. Adept at designing modular architectures, managing DevOps workflows, and collaborating cross-functionally in fast-paced, research-driven environments. Passionate about delivering robust, maintainable solutions to complex technical challenges.

## Experience

**Software Engineer - AI/ML** *(IBSS Corp)* **Silver Spring, Maryland** *06/2025 - Present*

- **NOAA Atlas 15:**
  - Extend and enhance the software suite responsible for building a comprehensive repository of historical precipitation gauge data (CONUS OCONUS) to support NOAA Atlas 15 Volume 1.
  - Ensure the repository, comprising full gauge time series and derived extreme-event series, adheres to FAIR principles, facilitating future national updates and long-term data stewardship.
  - Automate quality-control workflows, incorporating machine learning validation techniques and extracting extreme-event time series in line with Atlas 14 protocols.
  - Partner with NOAA and academic project investigators to verify, test, and refine the Atlas 15 software components.
  - Structure and maintained technical documentation and data libraries using electronic records management best practices.
  - Provide scientists with ad-hoc software utilities and modules as needed to streamline research workflows.
- **IBSS Headquarters & Total Assure:**
  - Support the development, integration, and maintenance of custom AI applications and automation pipelines across IBSS.
  - Contribute to AI and automation R&D efforts, researching emerging tools and frameworks.
  - Design and deliver training sessions for IBSS staff on AI best practices and business-process automation.
  - Led workshops for Total Assure clients to demonstrate AI-driven solutions and automation techniques.
  - Advise on AI policy and business-strategy initiatives, ensuring alignment with organizational goals.

**Graduate Research Assistant** *(University of Virginia)* **Charlottesville, Virginia** *08/2023 - 06/2025*

- Architected scalable ML pipelines for temporal forecasting and research idea generation using temporal graphs and LLMs.
- Built distributed data processing workflows in Linux using Apache PySpark and Python's multiprocessing and concurrent libraries to handle terabytes of biomedical text and graph data.
- Designed modular PyTorch Geometric pipelines with custom attention mechanisms for spatio-temporal representation learning.
- Trained LLMs with parallel GPU techniques such as Distributed Data Parallelism for scalable and efficient training and evaluation.
- Maintained reproducible experiments with Git, Conda, and Weights & Biases.
- Supervised graduate and undergraduate research assistants in implementing project code, conducting machine learning experiments, and analyzing experimental results.
- Published research in top-tier AI/ML venues and presented findings at AAAI's LLMs4Bio workshop.

**Software/ML Engineering Intern,** *(IBSS Corp)* **Silver Spring, Maryland** *06/2022 - 08/2023*

- Developed a real-time cyber threat detection system using LLMs and Python to stream and analyze live Twitter data.
- Built end-to-end DevOps pipelines with Docker and GitLab CI/CD to deploy ML services on AWS cloud infrastructure.
- Collaborated with frontend and backend developers to deploy RESTful APIs, dashboards, and Django-based backend services.
- Designed and deployed continuous web scraping pipelines to collect up-to-date social-media signals.
- Fine-tuned transformer-based models to extract insights from unstructured Twitter data.
- Facilitated internal tutorials on Unix and Python.
- Wrote technical blog posts demystifying AI concepts.

**Academic Software Engineering,** *(College of William and Mary)* **Williamsburg, Virginia** *08/2020 - 05/2023*

- Developed an Android maze game app with custom UI and automatic pathfinding using a greedy MST algorithm.
- Designed a full-stack college class scheduling app using Android Studio, SQLite, and Python web scraping pipelines.
- Implemented CI/CD workflows in GitLab and wrote unit tests for stability and regression testing.
- Practiced Agile development; conducted user research and created user stories to guide development.

## Skills

- **Programming Languages:** Python, Bash, SQL, Java, HTML, CSS
- **Frameworks & Libraries:** PyTorch, Huggingface, Weights & Biases, Scikit-learn, Django, Android SDK
- **DevOps & Cloud:** Docker, GitLab CI/CD, AWS (EC2)
- **Data Engineering:** Apache PySpark, Pandas, Numpy, Neo4j, SQLite, MongoDB, Beautifulsoup, RESTful APIs
- **Tools & Platforms:** Git, Linux/Unix, Conda, SLURM
- **Machine Learning:** LLMs, Graph Neural Networks, Representation Learning, Time Series Forecasting
- **Software Engineering:** Agile Development, Unit Testing, CI/CD, Code Review
- **Communication:** Technical Writing, Internal Training, Cross-functional Collaboration, Conference Presentations

## Education

**Master's Computer Science** *University of Virginia* **Charlottesville, Virginia** *08/2023-12/2025*

Research Advisor: Aidong Zhang

Relevant Courses: Natural Language Processing, Analyzing Online Behavior for Public Health, Cloud Computing, Risks and Benefits of LLMs and Generative AI, Geometry of Data, Convex Optimization

**BSc Computer Science** *College of William and Mary* **Williamsburg, Virginia** *08/2020-05/2023*

Relevant Courses: Data Mining, Neural Networks and Machine Learning, Computer Organization, Software Development, Operating Systems

## Publications

**2025**: **Shariatmadari, A. H.**, Guo, S., Sheffield, N., Jha, K., Zhang, A. "HyHG: A Temporal Hypergraph Contrastive Learning Framework for Biomedical Hypothesis Generation". *Under Peer Review.*

**2025**: **Shariatmadari, A. H.**, Jafari, A., Guo, S., Srinivasan, S., Sheffield, N., Jha, K., Zhang, A. "ConceptDrift: Leveraging Spatial, Temporal and Semantic Evolution of Biomedical Concepts for Hypothesis Generation". *Under Peer Review.*

**2025**: Guo, S., **Shariatmadari, A. H.**, Wang, J., Huang, A., Bekiranov, S., Zhang, S., Zhang, A. "InfRL: Inference-time Reinforcement Learning for Research Idea Optimization". *Under Peer Review.*

**2025**: Guo, S., **Shariatmadari, A. H.**, Wang, P., Huang, A., Zhang, A. "InfAL: Inference Time Adversarial Learning for Improving Research Ideation". *Under Peer Review.*

**2025**: Guo, S., **Shariatmadari, A. H.**, Xiong, G., Huang, A., Xie, E., Bekiranov, S., Zhang, A. "IdeaBench: Benchmarking Large Language Models for Research Idea Generation." *Accepted ACM SIGKDD'25.*

**2025**: Xiong, G., Xie, E., Williams, C., Kim, M., **Shariatmadari, A. H.**, Guo, S., Bekiranov, S., Zhang, A. "Toward Reliable Scientific Hypothesis Generation: Evaluating Truthfulness and Hallucination in Large Language Models". *Accepted IJCAI'25.*

**2024**: **Shariatmadari, A. H.**, Guo, S., Srinivasan, S., Zhang, A. "Harnessing the Power of Knowledge Graphs to Enhance LLM Explainability in the BioMedical Domain". *Presented at AAAI 2024-LLMs4Bio Workshop* (Presentation).

## Online Courses & Certifications

- Mathematics for Machine Learning Specialization (Aug. 2023) - Imperial College London, Coursera
- Machine Learning Specialization Certificate (Aug. 2022) - Stanford University, Coursera

## Languages

- **English** [Native]
- **Farsi** [Fluent]