

WARIS GILL

Blacksburg, Virginia 📍 +1-540-401-9689 ✉ waris@vt.edu [in linkedin.com/warisgill/](https://www.linkedin.com/warisgill/) [🌐 people.cs.vt.edu/waris/](https://people.cs.vt.edu/waris/)

EDUCATION

- **Virginia Tech**, College of Engineering Blacksburg, VA
PhD in Computer Science GPA: 3.92/4 *August 2021 - Present*
Research Area: Software Engineering & Federated Learning
Relevant Courses: Advanced Topics in Software Engineering, Hot Topics in Machine Learning (ML) and Security, Big Data Engineering
- **Koç University**, College of Engineering Istanbul, Turkey
Masters in Computer Science GPA: 3.85/4 *2018 - 2020*
Relevant Courses: Computer Vision with Deep Learning, Machine Learning, Algorithms, Parallel Programming, Distributed Systems
- **Lahore University of Management Sciences (LUMS)** Lahore, Pakistan
Bachelors in Computer Science GPA: 3.08/4 *2013 - 2017*
Relevant Courses: Data Mining, Data Structures, Databases, Operating Systems, Computational Problem Solving, Artificial Intelligence

PHD PUBLICATIONS

- **Waris Gill**, Ali Anwar, Muhammad Ali Gulzar, “FedDebug: Systematic Debugging for Federated Learning Applications” In ACM/IEEE 45th International Conference on Software Engineering (ICSE) 2023.
- **Waris Gill**, Ali Anwar, Muhammad Ali Gulzar, “FedDefender: Backdoor Attack Defense in Federated Learning” In Dependability and Trustworthiness of Safety-Critical Systems with Machine Learned Components (SE4SafeML) colocated with FSE-2023.

HONORS AND AWARDS

- **National Science Foundation (NSF) Award:** To present our paper, **FedDebug**, at ACM/IEEE 45th International Conference on Software Engineering (ICSE) 2023 in Melbourne, Australia.
- **ACM womENCourage 2019 Participation Scholarship:** To attend 6th ACM Celebration of Women in Computing: womENCourage, September 16-18, Rome Italy.
- **Huawei Graduate Research Support Scholarship:** Only two MS students from the computer engineering department of Koç University were awarded this scholarship in 2019. The scholarship provides funding for 2 years.
- **Koç University Project-based Graduate Scholarship:** The scholarship includes tuition waiver, monthly stipend, housing aid, and travel expenses to attend conferences.

PROFESSIONAL EXPERIENCE

- **Cisco** USA
Curricular Practical Training (CPT) Internship *May 2023 - December 1, 2023*
 - Currently working on developing Vowel’s semantic caching for Large Language Models to reduce overhead and cost.
 - Founder, developer, and maintainer of Cisco’s open-source project, MartianBank – a microservice app enhancing software supply chain, used by Outshift teams of Cisco. [🔗 MartianBank GitHub](#)
- **Virginia Tech**, Department of Computer Science Blacksburg, VA
Research Assistant - Dr. Muhammad Ali Gulzar *August 2021 - May 2023*
 - Built the first cutting-edge testing & debugging technique for Federated Learning applications in the IBM FL framework, which helps developers to locate clients with faulty neural networks. It efficiently locates problematic clients with a 90.3% average accuracy in just 2.1% of a round’s training time. [🔗 GitHub \(Accepted at ICSE 2023\)](#)
 - Conducted a measurement study on the reproducibility of 25,000 most popular open-source Jupyter Notebooks on GitHub. Performed AST analysis along with Vulture and Pyflakes tools to find dependencies between notebook cells. Discovered that almost 57% of the notebooks lack reproducibility due to incomplete cell execution order.
- **KUIS A.I. Lab & DISNET Research Laboratory (Koç University)** Istanbul, Turkey
Graduate Research Assistant - Dr. Attila Gürsoy and Dr. Öznur Özkasap *2018 - 2021*
 - Worked with *Tüpraş (Turkey’s leading oil refinery)* to optimize alarm analysis and helped refinery workers forecast upcoming alarms using RNNs and Transformer LMs. After evaluating 13 months worth of unstructured data, I managed to decrease the workload of refinery operators by 50%.

Technology for People Initiative (LUMS)

Lahore, Pakistan

Research Associate - Dr. Fareed Zaffar

2017 - 2018

- Developed an editorial support system with Node.js, JavaScript, D3.js, HTML, and MongoDB, funded by the *United States Institute of Peace (USIP)*, that has a searchable graph of topics extracted from news articles to identify topics of interest and study social trends like reporting biases using NLP techniques.

TEACHING ACTIVITY

- **CS-3304: Comparative Languages, TA**, Computer Science, Virginia Tech: Fall 2022
- **CS 1114: Introduction to Software Design, TA**, Computer Science, Virginia Tech: Fall 2021
- **Distributed Systems, TA**, Computer Science, Koç University: Spring 2020
- **Advanced Programming, TA**, Computer Science, Koç University: Spring 2019
- **Software Engineering, TA**, Computer Science, Koç University: Fall 2018, 2019 & 2020
- **Introduction to Programming, TA**, Computer Science, LUMS: Fall 2016

SELECTED ENGINEERING PROJECTS

- **🔗 Modeling Reach Rate of the QNB FinansBank, Turkey (Machine Learning)**: Predicted whether a customer will answer the phone call initiated by the outbound call center of the bank. With an AUROC of 0.76 on test data, my Gradient Boosting Classifier based solution won the prize by outperforming solutions based on neural networks.
- **🔗 Understanding Amazon Rainforest from Space (Computer Vision)**: I built a classifier that labels satellite images with atmospheric conditions (e.g., haze, primary, agriculture, road, water, cloudy) to observe changes over time using GoogleNet, ResNet, and DenseNet. It achieves an F-score of 0.93 with ResNet150.
- **🔗 Cardiac Electrophysiology Simulation (Parallel Programming)**: Implemented the Aliev-Panfilov heart electrophysiology simulator using CUDA, MPI and OpenMP.
- **🔗 Distributed Notebook Using DHT (Distributed Systems)**: Implement a Chord DHT to load and store notebooks using the Remote Procedure Call (RPC) protocol.
- **🔗 Harnessing Corrupt Packets in Wireless Sensor Networks (Embedded Systems)**: Proposed an optimized corrupt packet recovery algorithm to mitigate their retransmission and reduce battery consumption by recovering 60% of the corrupt packets. Modified the TinyOS network stack to implement an interface for intermediate processing of corrupt packets in WSNs.

SKILLS SUMMARY

- **Programming Languages**: Python, C, C++, Go, Java, JavaScript, TypeScript, SQL, R, Matlab
- **Machine & Deep Learning Frameworks**: PyTorch, PyTorch Lightning, Numpy, Pandas, Matplotlib, Hugging Face, Scikit-learn, CUDA, IBM FL, Spark, Docker, Kubernetes
- **Web Development Frameworks & Other Tools**: NodeJS, MongoDB, Express.js, D3.js, HTML, CSS, MySQL, MPI, RPC, Git

VOLUNTEERING SERVICES

- **Student Volunteer at FSE-2023**: Selected as one of only 18 students from 78 applicants to volunteer at FSE-2023. The conference is scheduled for December 3–9, 2023, in San Francisco, California, USA.
- **Student Volunteer at ICSE-2022**: Performed volunteer duties at ICSE-2022, held from May 22 to May 27, 2023, in Pittsburgh, Pennsylvania, USA.

REFERENCES

- **Dr. Muhammad Ali Gulzar (Ph.D. Advisor)** - *Assistant Professor, Virginia Tech*
✉ gulzar@vt.edu || 🔗 <https://people.cs.vt.edu/gulzar>
- **Dr. Ali Anwar (Research Collaborator)** - *Assistant Professor, University of Minnesota, Twin Cities*
✉ aanwar@umn.edu || 🔗 <https://cse.umn.edu/cs/ali-anwar>