

SELENAY BUSE BATIBAY



Education

Sabancı University (50% Scholarship), Istanbul/Turkey

2020 – 2025

Bachelor of Science in **Computer Science and Engineering**

- **Course Highlights:** Database Systems, Software Engineering, Machine Learning, Artificial Intelligence, Computer Networks, Cybersecurity Practices and Applications, Mobile Development
- Dean's High Honor List (Fall 2020 – Spring 2020)
- Dean's Honor List (Spring 2024 – Fall 2025)

Work Experience

Ericsson R&D Türkiye | Part-Time Security Researcher

July 2024 – January 2025 Istanbul, Turkey

- Conducted research on a framework for robustness-friendly and privacy-preserving federated learning.
- Implemented a federated learning setup with encryption using Keras, Tensorflow, Tensorflow Federated, and TenSEAL libraries.
- Tested the framework for robustness, computational and communicational complexity.
- Assisted senior researchers with the journal paper.

Papers

Ericsson R&D Türkiye | Part-Time Security Researcher

July 2024 – January 2025 Istanbul, Turkey

- Karakoç, F., Batibay, S. B., Karaçay, L., Fuladi, R., & Gülen, U. (2024). FASIL: A challenge-based framework for robustness-friendly and privacy-preserving federated learning. *CSNet 2024 Conference*.

Projects

- **Comparative Analysis of Morphology-Enhanced CNNs for Robust Hyperspectral Image Classification - Graduation Project**
 - Conducted a comparative study of standard CNNs and morphology-enhanced CNNs on the University of Pavia hyperspectral dataset.
 - Evaluated models using **cross-domain testing** to assess their robustness and generalization capabilities.
 - Highlighted **domain generalization** as a key approach to addressing distribution shifts in hyperspectral image classification.
- **Privacy Preserving Intrusion Detection System - Ericsson R&D**
 - Developed a fully functional Federated Learning setup for **intrusion detection system for IoT devices**.
 - Utilized publicly available Edge-IoT dataset.
 - Integrated Homomorphic Encryption to FL setup for security.
- **FASIL: A challenge-based framework for robustness-friendly and privacy-preserving federated learning - Ericsson R&D**
 - Assisted senior researchers with developing a new framework for **privacy preserving communication between clients and servers in federated learning**.
 - Employed TenSEAL library for **homomorphic encryption**.
 - Tested the setup against **DLG and Label flipping attacks**.
 - Currently have a **patent pending acceptance** for this new framework with Ericsson R&D team.
- **Advanced Security and User Interaction Features for Web-Based News Platform**
 - Developed a web news platform with user management, and **RSS feed** integration.
 - Established security logging for tracking user activities and authentication processes.
 - Enhanced system security by resolving **XSS, SQL Injection**, and data exposure issues through various mitigation strategies.
 - Leveraged multiple **static code analysis tools** to identify and **fix vulnerabilities**, improving code security and maintainability.
- **Music Streaming Platform – MUSICEE**
 - The development of a **music streaming platform** for both web browsers and mobile devices has been finalized.
 - Aesthetic designs for the website are created using **Figma** and **Canva**.
 - Python is employed for backend development, with **MongoDB** as the primary database.
 - Deployment is efficiently executed through **Circle CI**.
 - The frontend utilizes **NEXT.JS, Tailwind CSS, and React**.
 - Mobile app development is carried out using **Flutter** and **Android Studio**.
 - Agile methodologies manage the entire development process, overseen by **JIRA** and **GitHub**.
- **TutorDesk – Weekly Planning and Financial Management Tool for private tutors (Ongoing)**
 - Aimed at simplifying lesson scheduling and payment tracking for private tutors.
 - Developed a **fullstack mobile application for Android and IOS**.
 - Utilized **Flutter** for Android and IOS compatibility.

- Employed **Firestore Auth** and **Cloud Firestore** for user authentication and cloud storage.

- **Web Application Testing and Quality Assurance**

- **Designed and implemented test scenarios** tailored to the website's structure and functionalities.

- **Developed automated test scripts using Python and Selenium** to verify the presence and functionality of essential web pages and features.

- **Implemented end-to-end testing workflows** to ensure critical website components were accessible and operational.

- **Enhanced reliability and quality assurance** by detecting broken links, missing elements, and malfunctioning functions during testing.

Skills

- Python | Tensorflow, Tensorflow Federated | TenSEAL | PyTorch | C++, C#, C | Java, JavaScript, Next.js, Vue.js | Flutter | Dart | Linux, Kali | PHP | MySQL, MongoDB, PostgreSQL | Postman | Wireshark | Agile Methodologies, Jira | Docker | Kubernetes | Google Cloud Platform, AWS, Azure | Selenium
- Languages: Turkish (Native), English (Proficient), German (Basic), Japanese (Beginner)
- Sports: Professional Wind Surfer

Volunteering

- **Sabancı University Women in Engineering Club (Sabancı WIE)** | Organization Team Member September 2021 – June 2022
 - Scheduled workshops and panels with experienced women in business life.
- **Learning Assistant at Sabancı University** September 2021 – June 2022
 - Committed voluntary assistantship for courses NS 101 and NS 102
 - Managed to keep weekly recitations under control
 - Assisted students who had difficulties understanding basic engineering concepts
 - Guided them to abstract thinking and adapting these concepts to daily life

References

- Dr. Ömer Faruk Tuna - omer.tuna@ericsson.com - Ericsson Türkiye Security Research Lead
- Dr. Orçun Çetin - orcun.cetin@sabanciuniv.edu - Academic Director of the Professional Master's Program in Cybersecurity
- Assoc. Prof. Erchan Aptoula - erchan.aptoula@sabanciuniv.edu - Department of Computer Science, Image Processing and Deep Learning