

Mahmut Semih Akkoç

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EDUCATION

- **University of Maryland, College Park** College Park, Maryland
Ph.D. at Electrical and Computer Engineering - Advisor: Prof. Sennur Ulukus Sep. 2025 - Aug. 2030 (*Expected*)
- **Bilkent University** Ankara, Türkiye
B.Sc. Electrical and Electronics Engineering - **GPA: 3.92/4.00** May 2025
- **National University of Singapore** Singapore
Exchange Student in Electrical and Computer Engineering May 2024
Relevant Courses: Quantum Communication and Cryptography, Quantum Mechanics I, Probability

EXPERIENCE AND PROJECTS

Bilkent University Ankara, Türkiye
Undergraduate Researcher Feb. 2023 - Present

- **Semantic Signal Processing:**
 - Engaged as an undergraduate researcher within the research group led by Professor Orhan Arikan, specializing in Semantic Signal Processing.
 - Concentrated efforts on the hardware demonstration of semantic signal processing through the utilization of Raspberry Pi.
- **Computational Electromagnetics:**
 - Participated as an undergraduate researcher in Professor Vakur Erturk's research group, focusing on Computational Electromagnetics.
 - Implemented and simulated plane wave scattering by a perfectly conducting strip using method of moments.

Aselsan Ankara, Türkiye
Summer Intern Aug. 2024 - Sep. 2024

- **Development and Simulation of a Suspended Ring Resonator Model for Dielectric Permittivity Measurement Using MATLAB and CST Studio:**
 - Implemented a MATLAB-based simulation to estimate the dielectric constant and loss tangent of materials, providing a low-cost solution for measuring antenna-related materials.
 - Modeled and simulated the resonator in CST Studio, comparing results with MATLAB simulations to enhance accuracy.
 - Created a flexible lookup table and polynomial fits for material property estimation, making the tool adaptable for a range of dielectric materials.

Huawei Ankara, Türkiye
R&D Intern Jun. 2023 - Aug. 2023

- **Practical Hardware Implementation of a Multi-Sensor Homogeneous Goal-Oriented Semantic Communications Network:**
 - Designed a network of two Raspberry Pi devices equipped with camera modules to capture and process visual data through on-device semantic extraction which achieved 143% data reduction compared to conventional methods.
 - Implemented a network protocol that utilizes TCP protocol for transmitting locally processed camera data between the Raspberry Pi devices.
 - Developed a fusion algorithm to merge incoming data streams from the Raspberry Pi devices, enhancing data integration and accuracy by 67.2% relative to non-fused data.

BİTES - Defence & Aerospace Technologies Ankara, Türkiye
Summer Intern Jun. 2022 - Aug. 2022

- **Multifunctional File Transfer System with Socket Networking and Design Patterns Integration:**
 - Developed a file transfer program using sockets and threads as part of an internship course.
 - Implemented the program to read and write files in binary mode, allowing for the transfer of any file type.
 - Utilized various design patterns, including the factory method pattern for socket creation and initialization and the observer (listener) pattern to notify the socket when the worker has completed its task.
 - Demonstrated proficiency in networking concepts, multithreading, and design patterns through the successful completion of the project.

Akkoc, S., Cinar, A., Ercan, B., Kalfa, M., Arikan, O. (2024). Practical Hardware Demonstration of a Multi-Sensor Goal-Oriented Semantic Signal Processing and Communications Network. *The Journal of the Franklin Institute*, Volume 362, Issue 1.

- ## Li-Fi Implementation on BASYS3 Board

- ## HONORS AND AWARDS

Research Excellence Award Bilkent University Department of Electrical and Electronics Engineering - 2025
In recognition of outstanding research contributions.

Best Project Award Bilkent University Department of Physics - 2022
 Awarded the Physics Department's Best Project Award at Bilkent University for project excellence and originality.