



# MAHMUT ESAT KOLAY

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## SUMMARY

Computer Engineering student with hands-on experience in machine learning, robotics, and industrial automation, focused on predictive maintenance, time-series modeling, and AI-based analysis for aerospace and defense-related systems. I have practical experience developing LSTM-based models and working, as well as data-driven engineering workflows using Python and C++, aiming to apply engineering discipline and analytical thinking to real-world, safety-critical systems.

## EDUCATION



### Selcuk University

Sep 2023 - Jun 2027

#### Bachelor of Computer Engineering

- Working on projects in Machine Learning, Deep Learning, and Data Science using Python and real-world datasets
- Studied fundamental topics: algorithms, data structures, object-oriented programming, databases



### Mehmet Tuza Pakpen Technical High School

Sep 2019 - Jun 2023

#### Industrial Automation Technologies

- Worked on IoT-based projects combining basic software and electronics skills
- Studied core topics: microcontroller programming, circuit design, PLC systems, and industrial sensors

## PROJECTS

### Aerospace Battery RUL Prediction (IAC 2026) Technologies: Deep Learning, LSTM, Explainable AI

- Developed an explainable LSTM + attention-based RUL model for aerospace Li-Ion batteries, achieving ~84% RMSE reduction in critical cases and validated across multiple thermal conditions; selected for T3 Foundation Young Researcher Support.

### RUL Prediction of Turbofan Engines Technologies: LSTM Networks, Predictive Maintenance

- Built an LSTM-based time-series model for aircraft turbofan RUL estimation, achieving an RMSE of 13.87 on unseen test data, outperforming standard benchmark results (~15.0).

### 6-DOF Robot Arm Forward Kinematics Simulator Technologies: Python, NumPy, Robotics Library

- Developed a simulator to calculate and visualize the end-effector position of a 6-DOF robotic arm using forward kinematics equations.

### Secure On-Prem RAG System for Aircraft Maintenance System Architecture, RAG

- Designed an on-premise, air-gapped RAG-based decision support system enabling citation-based querying of aircraft maintenance manuals; prepared as part of a national entrepreneurship and defense-focused program application.

## PUBLICATIONS & COMMUNITY

### 77th Int. Astronautical Congress (IAC 2026) – Antalya

- Paper: "Explainable RUL Prediction for Aerospace Li-Ion Batteries"
- Achievement: Selected for the prestigious T3 Foundation Young Researcher Support Program.

### Unilever Chain Reaction @ U-House

- Selected for the exclusive supply chain simulation at U-House; analyzed data-driven optimization strategies in a competitive environment.

### BTK Ankara AI Hackathon @ Ankara Teknopark

- Participated in a time-constrained AI hackathon, developing a functional prototype under real-world constraints with a multidisciplinary team.

## WORK EXPERIENCE



### Intern – Computer Engineering & Product Management Sep 2025 - Nov 2025

- Completed an AI & Startup Strategy Fellowship, applying Founder and Project Mindset to develop ideas from 0 to 1.
- Built workflow automations with UiPath and used Google AI tools to create generative AI-driven business solutions.



### Intern – Computer Engineering & Robotics jun 2025 - July 2025

- Designed and implemented ML-driven fault detection algorithms for industrial robotic systems
- Programmed KUKA robots and analyzed motion through kinematics and dynamic modeling



### Intern – Industrial Automation & Control Systems jun 2022 - Oct 2022

- Assisted in PLC programming, control panel design, and machine wiring for industrial automation systems
- Contributed to the development of electrical systems for packaging and stretch wrapping machines
- Observed and analyzed existing automation systems to identify improvements in operational efficiency

## CERTIFICATES



### TEI Aviation Engines School

- TUSAS Engine Industries | Jan 2026 - Present
- (Accepted into the specialized aerospace engine training program)



### Unilever Supply Chain + Chain Reaction



### Aspire Institute - Aspire Leaders Program



### Deloitte Australia - Data Analytics



### Fundamentals of Deep Learning



### Academy Of Responsible Development Erasmus+



### Intermediate Machine Learning

## TECHNICAL SKILLS

**Data Eng. & Analytics:** Power BI, SQL, ETL, Web Scraping, Pandas

**AI & Machine Learning:** LLM, RAG, Computer Vision, Deep Learning

**Languages:** Python, C++, C#, Java

**Robotics & Automation:** KUKA Sim Pro, KRL, PLC, ROS, IoT

**DevOps & Tools:** Git, Docker, UiPath, Linux