HASAN KALYONCU UNIVERSITY
Electrical-Electronics Engineering Department
EE 499 Project Proposal Form

Part I. Project Proposer

Name Last name		**E-mail**	
		Date	

Part II. Project Information

Title of the Project	Edge AI-Based Real-Time Fault Detection in IIoT				
Maximum Cost of implementation (TL)	1500 - 2000 TL	**Conceptual Design Dead Line**	**in 7 weeks**	**Prototype Production Deadline**	**in 10 weeks**
Standards and licenses to be used in the project. example; IP65, IEEE, APACHE, MIT, etc.	IEEE 2030.5 (Smart Energy), ISO 50001 (Energy Management)				

Project Description

The aim of this project is to design and implement a real-time fault detection system for Industrial Internet of Things (IIoT) environments by leveraging edge artificial intelligence (Edge AI) devices and multi-sensor data streams, including vibration, temperature, and other critical operational parameters. Unlike traditional centralized monitoring systems that rely heavily on cloud processing, this approach emphasizes decentralized intelligence, where data is processed locally on edge devices (e.g., Raspberry Pi, NVIDIA Jetson) to ensure faster response times, reduced latency, and enhanced reliability.

The system will integrate smart sensors compliant with IEEE 1451 standards for seamless communication and interoperability, while adhering to the ISO/IEC 30141 IoT Reference Architecture to guarantee scalability, modularity, and secure system design.

Project Justification

Novelty	
New aspects	**End-to-End Learning: Integrates image feature extraction and sentence generation in a single model.**
Complexity	
Challenging problem and issues	
Related electrical-electronics science fields and subfields	This project combines mechatronics, AI, and robotics in a novel application with strong research and industrial value.

Tools	Python, OpenAI Gym, ROS, Gazebo, DJI Tello/Parrot drones
Risk involved	
Potential problems and alternative solutions	
Minimum work required	10 weeks, 2 developers