

BEYZA KARARTI

Personal Information

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Personal Introduction

Beyza KARARTI is a senior Electrical and Electronics Engineering student at Afyon Kocatepe University and is currently spending her senior year at the University of Duisburg-Essen (Germany) as an Erasmus+ exchange student. She is particularly interested in renewable energy technologies and has gained field experience in wind and hybrid energy systems. She has actively worked with SCADA systems, energy generation processes, and automation infrastructures.

In addition, she continuously improves herself in software and hardware development, producing projects in data analysis, signal processing, and automation using programming languages such as Python, C++, and R. She has experience in PCB design, microcontrollers, and sensor applications. She is also interested in advanced engineering topics such as FPGA, VLSI CAD, and chip design, aiming to develop effective solutions in the defense, automotive, and energy sectors in the future. By participating in interdisciplinary projects, she closely follows technological advancements and plays an active role in data-driven decision-making processes.

Interests, Research Topics & Talents

PCB Design & Simulation

- Making PCB card design-simulation via Proteus, Altium and Eagle CAD programs.

Microcontrollers & Embedded Systems

- Arduino programming, preparing projects with Arduino
- Tinkerboard, Raspberry Pi and PIC programming
- Chip Design and Coding
- Embedded Linux systems

Software, Analysis & Calculation

- Coding and data science with Python, C++, C# and R
- Performing electronic and mechanical analysis and simulation with ANSYS
- Software installation, complex calculations and simulations commissioned with Matlab & Matlab Simulink programs
- Chip design via Xilinx and Logisim
- Cloud software
- Virtual Machines and digital twins

Mechanical Design

- Technical drawing, 2- and 3-dimensional industrial design preparation with Catia, Solidworks and Nx Siemens drawing programs

Energy Resources & Renewable Energy Systems

- Power Plants (Wind Turbines, Solar Energy Systems, HEPP and Nuclear Reactors)
- Battery and Battery Systems

Education Information & Activities

UNIVERSITY OF DUISBURG-ESSEN (GERMANY)

Erasmus+ Exchange Student – Senior Year (October 2026 – Present)

AFYON KOCATEPE UNIVERSITY FACULTY OF TECHNOLOGY

Department of Electrical and Electronics Engineering (2021 – Present)

TEKNOFEST 2022 INTERNATIONAL UNMANNED AERIAL VEHICLES COMPETITION

With the support provided by Afyon Kocatepe University's workshop and Teknofest, she participated as a member of the AKUFLYT3CH team in the 2022 Teknofest Free Mission Unmanned Aerial Vehicles competition, contributing in the areas of technical applications and theoretical calculations. The team qualified for the finals and ranked 34th nationwide after the finals.

TEKNOFEST 2023 INTERNATIONAL UNMANNED AERIAL VEHICLES COMPETITION

She participated as the Assistant Captain of the AKÜ ZADA team in the 2023 Teknofest Free Mission Unmanned Aerial Vehicles competition, where they ranked 15th out of 960 teams in the initial summary stage and advanced to the next phase. However, the preparation process for the competition was halted due to the earthquake on February 6th.

Experience

Akfen Renewable Energy Inc.

She completed a 34-day internship at Akfen Renewable Energy Inc., a subsidiary of Akfen Holding, located in Ankara. The intensive work with experienced engineers, along with the training and skills gained, are detailed as follows:

- Learned the types of power plants, their purposes, and all essential basic information.
- Gained knowledge about the permits required for constructing power plants, land conditions, and the agreements involved.
- Learned how to read and analyze single-line diagrams of power plants.
- Studied the different types of generators within power plants and their internal structures.
- Examined the procedures and technical details for capacity upgrades and converting power plants to hybrid systems.
- Learned the calculations for power plant efficiency and all related analyses.
- Acquired skills in correcting errors in single-line diagrams using AutoCAD and reporting them.

OUTLIER

Outlier is a company specializing in data analysis and data science. One of its primary areas of expertise is detecting outliers in datasets and preventing these outliers from compromising data analyses. Outlier is managed by a team of experts in this field, aiming to minimize the impact of outliers in data analysis processes. She worked in the artificial intelligence testing team at this company for approximately one year, participating in AI model testing in both English and Turkish. The training and skills gained during this time are outlined as follows:

- Received briefings on data analysis and AI testing models.
- Successfully completed language tests following the briefings and underwent training on the Turkish and English models based on the test results.
- After successfully completing the training, she conducted tests on the AI model being developed in both Turkish and English.

ENERJISA ENERJİ ÜRETİM A.Ş.

A 30-workday internship was completed at the Wind Power Plant located in Çanakkale.

- Technical knowledge was gained on wind turbines, SCADA systems, and energy generation processes. The internal structure of turbines, fault detection, and maintenance procedures were observed on-site.
- Production monitoring, fault analysis, and switching operations were actively tracked and reported via the SCADA system.
- Single-line diagrams were reviewed and revised using AutoCAD.
- Fundamental knowledge of high-voltage systems and transformer structures was acquired in accordance with occupational health and safety regulations.

Licenses & Certificates

TEKNOFEST

Teknofest 2022 Free Mission Unmanned Aerial Vehicles Competition Finalist Team Certificate

General Directorate of Civil Aviation of Turkey

UAV - Unmanned Aerial Vehicle Pilot Certificate

SAMSUNG INNOVATION CAMPUS & HACKATHON

Samsung Coding & Programming Course and Python Hackathon

AUTOMOTIVE INDUSTRY ASSOCIATION

Certificate of participation in the automotive summer camp Certificate No.: OSDEFF8A38D

Association of Women in Technology

Miracles of Sprouts Technology and Innovation Certificate No.: 85772390820131

National Association of State Boards of Accountancy (NASBA)

Cloud Security and Audit Fundamentals: AWS, Microsoft Azure, and Google Cloud

Project Management Institute

Cybersecurity Awareness: Protect Your Privacy

Project Management Institute

PMI Agile Certified Practitioner (PMI-ACP)®

CompTIA

Data Science on Google Cloud Platform: Designing Data Warehouses

International Business Management Institute Berlin Germany

Business-English-Certification-Test-IBM C2 Certificate ID: 1226363-172-365-3046

International Business Management Institute Berlin Germany

Deutsches Sprachzertifikat für den Beruf (DSZ-B) Credential ID 1226363-172-422-8122

Microsoft And LinkedIn

Career Essentials in Cybersecurity by Microsoft and LinkedIn

CompTIA

Linux System Engineer: Networking and SSH

LinkedIn Learning

Siemens NX Grundkurs Zeichnungen erstellen

LinkedIn Learning

Unreal: Blueprint

UDEMY

SIEMENS S7-300 PLC General Training • Flight Mechanics - From Theory to Certification of Aircraft • Introduction to Orbital Mechanics for Engineering Students • Ansys Workbench - Training of Analytical Engineers • ASP.NET MVC 5 • SASS Principles and Visual Studio • MATLAB Master Class: Go from Beginner to Expert in MATLAB • Python A-Z™: Data Science and Machine Learning • 3D Solar Power Plant Design with PVSOL 2023

Computer Skills

Beginner:

- **Nx Siemens:** Various drawings created for entertainment purposes.
- **Solidworks:** Used for Teknofest projects, assignments, and various drawings for entertainment purposes.
- **ANSYS Electronics:** Currently in the learning process.

Intermediate:

- **Mission Planner:** Utilized for Teknofest projects.
- **Catia:** Various drawings created for entertainment purposes.
- **Logisim:** Currently in the learning process.
- **Xilinx:** Learned in school and used for various projects.
- **Simatic S7:** Learned in school and used for various projects.
- **C#:** Various projects created for entertainment purposes; learning process ongoing.
- **PV SOL:** Currently in the learning process.

Advanced:

- **Matlab:** Used for Teknofest projects and for analyzing and verifying school assignments.
- **AutoCAD:** Used for Teknofest projects, assignments, and various drawings for entertainment purposes.
- **Proteus, Altium, Eagle CAD:** Used for Teknofest projects, assignments, and various drawings for entertainment purposes.
- **Python, C++, JavaScript, HTML, Arduino:** Used for Teknofest projects, assignments, and entertainment purposes.
- **VS Code:** Primary development environment for all software projects (Python, JavaScript/TypeScript, C#, web and embedded development), including Git/GitHub integration and debugging.

Foreign Language

English: C1 (Reading-Writing-Speaking-Academic)

German: A2-B1 (Reading-Writing-Speaking)

Projects

Software & Engineering Projects (GitHub: github.com/beyzakararti)

MotorSense – Engine Sound Frequency Analysis & Fault Detection

Python, FastAPI, Expo (React Native), TypeScript, signal processing

Mobile MVP that analyzes 30-second engine recordings: converts audio to mono WAV, extracts Welch power spectra and band energies, compares them with reference profiles from a catalog of 8,577 engines and produces explainable early-anomaly findings. Includes role-based panels and a consent-based data development workflow.

FRAGWATT – 330 W Modular Power Station for Gaming Laptops (Kararti Solutions)

Power electronics, BMS, PCB design, Python, C, OpenSCAD, HTML/JS

Portable power station that supplies gaming laptops through the barrel input at up to 330 W. Two-phase bidirectional buck-boost ($2 \times$ TI LM5177, 98.4% efficiency at 330 W), TI BQ76942 BMS, USB-C PD 3.1 EPR 240 W charging, a 6-layer power board routed with a custom A* auto-router, 16-scenario thermal and battery-life simulations, an in-house 240 W GaN charger design and an interactive engineering website (schematics, BOM, 3D CAD).

Arkoveya Energy Forward – Blockchain-Based Corporate Renewable Energy Forward-PPA Platform

JavaScript, Solidity, SQLite, local EVM

Two-sided pilot platform for renewable energy developers and corporate buyers: ERC-1155 energy rights, escrow payments and collateral, digitally signed A4 contracts, production verification, dispute and compensation workflows. Security features include scrypt password storage, CSRF/Origin checks, role-based data separation and hash-chained audit logs.

ATLAS – Global Traffic Observatory & 3D Route Simulation

TypeScript, React 19, Three.js, satellite.js, Cloudflare Workers

3D global observation interface with vehicle-independent route planning: evaluates drone, aircraft, ship and land routes using live air-traffic snapshots and Open-Meteo wind data, compares wind layers to compute ground speed and duration, and animates the selected route on a 3D globe. Covered by 49 automated tests.

Pati-Nabız – Pet Health & Care Management Platform | app.vetaisoft.com

Next.js 15, React 19, TypeScript, Tailwind CSS, NextAuth, Vitest, Playwright

Web platform for pet owners, veterinarians and administrators: health records, appointment management, medication tracking, microchip registration workflow, QR-code emergency cards, PDF reports and clinic search on a map; tested with unit, end-to-end and accessibility tests.

DablSync – Granule Dosing System Web Platform (Sabyeza Dynamics)

JavaScript, C#/.NET 8, PostgreSQL, Docker

Website, Studio application and API for the DablSync granule dosing system, including product catalog, cart and order management, containerized for one-command deployment.

Inkasa Foods – Social Media Automation Panel

Python (FastAPI), TypeScript, Claude API, Meta / TikTok / YouTube APIs

Single dashboard that manages Instagram, Facebook, TikTok and YouTube accounts: AI-generated daily posts and videos, approval workflow, scheduled publishing, analytics charts and a unified inbox for messages and comments, built entirely on official platform APIs.

Gesture 3D Viewer | github.com/beyzakararti/gesture-3d-viewer

JavaScript, Electron, Three.js, Python, MediaPipe

Desktop application that overlays local 3D models (GLB/STL/OBJ) and presentation images on the webcam feed and controls them with hand gestures (pinch-drag, open-palm rotation, two-hand zoom); all processing runs locally.

beyzakararti.com – Personal Website | www.beyzakararti.com

HTML, CSS, JavaScript, Ollama (local LLM)

Personal website with research, projects and blog pages, including byeza.ai, a local LLM assistant that answers questions based on the site content.

Except for Gesture 3D Viewer, the repositories are private; access can be provided upon request.

Hardware & Embedded Projects

- Adjustable Power Supply Design Project
- ESP32-Based Remotely Controlled 360-Degree Rotating Weapon System
- Arduino-Based Remotely Controlled Tank Project
- Arduino-Based Remotely Controlled Spider Robot Project
- ESP32-Based Flying Stand-Off Jammer System
- Automobile Engine Fault Detection Project With Tinkerboard Based Machine Learning And Frequency Analysis

Published Researches

Design of a Blockchain-Based Microgrid Energy Trading System and Efficiency Analyses

Url: researchgate.net/publication/384070001

Frequency Analysis of Car Engine Sounds and Fault Detection with Machine Learning

Url: researchgate.net/publication/385504225

The Spacetime Thinning Hypothesis: A Framework for Exploring the Expansion of the Universe and Its Consequences

Url: researchgate.net/publication/387790764

Design of a Chemical Disintegration System for Autonomous Decommissioning: An Acid-Based Approach to Space Debris Mitigation

Url: researchgate.net/publication/398892005

A Synchronized Dual-UAV System for Border, Forest, and Military Facility Perimeter Surveillance: A Review of Image-Processing-Based Detection and Autonomous Charging-Rotation Architecture

Url: researchgate.net/publication/410952804

Satellite Spoofing (Satellite Twinning) Methods for Operational Electronic Deception: A Literature Review on the Security Vulnerabilities and Countermeasure Architecture of Free-Space Optical (FSO) Communication-Based Receiver Systems

Url: researchgate.net/publication/410952389

Radioactive Decay-Based True Random Number Generation (TRNG): A Review of Its Applicability in High-Security Satellite Systems, Encrypted Communication Devices, Cold Crypto Wallets, Data Centers, and Stand-Off Jammer (SOJ) Technologies

Url: researchgate.net/publication/410953722