KAAN BEYDUZ

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EDUCATION & QUALIFICATIONS

University of California, Berkeley (UC, Berkeley) August 2023 - May 2024
Master of Engineering in Mechanical Engineering: Control of Robotic and Autonomous Systems with Engineering Data Science TECH+PLUS Certification **GPA: 3.87 / 4.00**

Relevant Coursework:

- **MECENG 236**: Control and Dynamics of Unmanned Aerial Vehicles
- **MECENG 232 - 233**: Advanced Controls - I and II (Modern Control Theory)
- **MECENG 231B**: Experiential Advanced Controls - II (Prediction and Estimation)
- **MECENG 235**: Design of Microprocessor-Based Mechanical Systems (LabVIEW course)
- **MECENG 249**: Machine Learning Tools for Modeling Energy Transport and Conversion Processes

University of Wisconsin-Madison (UW-Madison) Sept. 2019 - May 2023
Bachelor of Science in Mechanical Engineering with Manufacturing Engineering Certification **GPA: 3.69 / 4.00**

Relevant Coursework:

- **ME368**: Engineering Measurement and Instrumentation (LabVIEW course)
- **ME 447**: Computer Control of Machines and Processes
- **ME 439**: Introduction to Robotics

SKILLS & ABILITIES

Programming Languages:

- **Phyton** (SciPy, FiPy, Ultralytics)
- **MATLAB & Simulink** (control design, image/signal processing)
- **C++** (Arduino/ESP32 hardware implementations)
- **LabVIEW** (GUI design)
- **ROS** (Noetic, Foxy for ROS2)
- **RAPID** (ABB Robot Programming Language)

Technical Skills:

- Control algorithm development for guidance and navigation
- Machine Learning for mechanical design and modeling
- Data analysis for forecasting, sparsity and filtering
- Mechatronics system modeling and software development
- Image processing and analysis

Interpersonal Skills:

- Highly adaptive in different work environments
- Enthusiastic for new challenges
- Effective communicator across technical teams
- Quick learner and resilient under pressure
- Proficient in Agile development practices

WORK EXPERIENCE

Fluffy Network Attached Storage (Fluffy NAS): Home Storage Devices Rockville, Maryland, USA
Co-Founder June 2024 - present

- **Crowd-funded** the Fipsy FPGA V2 educational development board, spearheading marketing strategies.
- **Collaborated with manufacturers** to asses cost and production quantities for the beta product launch of Fluffy NAS PCB board. Directed the mechanical design and oversaw manufacturing of the Fluffy NAS Lite PCB board.
- **Simulated and evaluated active and passive cooling methods** for the Fluffy NAS Lite PCB board, optimizing the casing design to enhance thermal performance.

Ozler Plastic Corp. (Multi-national Injection Molding Company) Avcilar, Istanbul, Turkey
Robotics and Automation Engineer Intern (1 month) January 2023

- **Developed PLC ladder logic** of the packaging process using Automation Studio and designed tool paths for a 6 degrees of freedom ABB brand robot, using Robot Studio.
- **Simulated and animated the equipment layout** and workflow for the packaging process, delivering a comprehensive presentation to management.
- **Programmed and validated robotic tool paths** using RAPID language, conducting hands-on testing on decommissioned ABB robot with the ABB Teach Pendant.

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Yucel Industrial Pipes and Profiles LLC., (Yucel Boru) Gebze, Kocaeli, Turkey
Maintenance Engineer Intern June 2022 - July 2022

- **Diagnosed machine component malfunctions** and collaborated with the chief mechanical engineer to oversee bimonthly maintenance, ensuring operational reliability.
- **Authored comprehensive technical documentation** on roll-forming and slitting machines, solid-state high-frequency welding, electric generators, conveyors, hydraulic and pneumatic control systems.
- **Integrated sensors and contributed to PLC logic design** into a factory's process line, enabling performance monitoring and optimized machine operations.

Uskudar American Academy (UAA) Online
Part Time Teacher and Team Mentor Sept. 2020 - August 2021

- **Directed the development** of an underwater drone tailored for marine research applications, modeling propellers, chassis and control laws using MATLAB/Simulink and Solidworks.
- **Automated** an air-filtering "Covid-Bot" for classroom interaction and effective air filtration. Validated navigation algorithms in ROS and guided the engineering and manufacturing process.

ACCOMPLISHMENTS & SCIENTIFIC RESEARCH

Pfizer Drone Racing League Artificial Intelligence Flight Competition Grand Prize Winner Nov. 2024

- **Engineered a solution to an object tracking problem,** and earned a racing drone and merch worth $5,000.
- **Integrated** the YOLOv8 object detection algorithm with Extended Kalman Filter and Optical Flow methods to extract precise 2D position data from video footage of a drone operating in an indoor environment.

Master's CAPSTONE Design Project at UC, Berkeley HIPER Lab: Design and Control of a Multimodal Flying - Driving Delivery Robot
Advisor: Dr. Mark Mueller Sept. 2023 – May 2024

- **Developed Python and ROS based software** for the navigation, control and state estimation of a hybrid delivery robot, integrating flying and driving modes with precise position control.
- **Modeled the transmission system dynamics** using MATLAB/Simulink, optimizing design parameters for seamless hybrid mode transitions. 3D modeled the transmission components in Solidworks, supervised the manufacturing process, and validated performance against MATLAB simulations.
- **Lead a multidisciplinary team** through the engineering process, coordinating team meetings, managing timelines, and ensuring successful project submission.

UW-Madison Undergraduate Independent Research: Laboratory Measurement of the Effect of Surface Waves on the Settling Velocity of Microplastics
Advisor: Dr. Nimish Pujara October 2021 - May 2023

- **Awarded the Hilldale Undergraduate Research Fellowship** for a proposed study on microplastic particle interactions with surface waves, securing $3,000 in personal funding and $,1000 for research expenses.
- **Presented research findings** at the Wisconsin American Water Research Association (AWRA) 2022 Annual Meeting as a poster speaker and at the University of Wisconsin Research Symposium in April 2023.
- **Engineered an innovative particle-dropping mechanism** with Arduino-controlled timing for precision particle imaging, and processed Particle Image Velocimetry (PIV) data using MATLAB image processing toolbox.

Bachelor's CAPSTONE Project at UW-Madison: Calibration Techniques for an Inertial Measurement Unit
Advisor: Dr. Michael Cheadle February 2022 - Dec. 2022

- **Developed an image processing algorithm** in MATLAB to accurately measure the motion of the calibration device and a MATLAB application to visualize results, and provide real-time feedback to optimize device parameters.
- **Constructed a user interface** with low-voltage electronics, including knobs and buttons, and utilized Arduino for motion feedback and control. Integrated safety mechanisms to ensure seamless high-to-low voltage conversions.