Burhan ÖLMEZ

Curriculum Vitae

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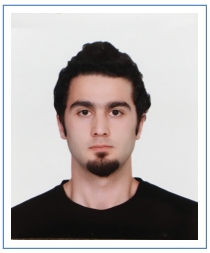

Education

2017–2021 **Middle East Technical University**, *MS*, *Electrical and Electronics Engineering*.
Specialized in Signal Processing Area, CGPA=3.29/4.00

2012–2017 **Middle East Technical University**, *BS*, *Electrical and Electronics Engineering*.
Specialized in Telecommunication Area, CGPA=3.23/4.00

2012–2017 **Middle East Technical University**, *Minor*, *Industrial Engineering*.
Specialized in Operations Research

2008–2012 **Ankara Polatlı Anatolian High School**, *Minor*, *Math and Science*.
Ranked First in class, CGPA=93.82/100, Ranked 0.03% in University Entrance Exam

Additional Education

September 2019 **Developing with Embedded Linux**, DOULOS, *5 days of hands-on training on Embedded Linux system with lots of practical examples on debugging, analysing and developing kernel*.

January - June 2016 **METU 2nd Interdisciplinary Design Studio**, METU, *A design team consisted of 8 students from various departments in METU, worked on user experience and improvement of UX results with the helps of IoT with two academic mentors and two mentors from industry (Arcelik)*.

June - August 2015 **Ericsson ICT Foundation Program**, ERICSSON, *Education on Networked Society, Business&ICT Industry Fundamentals, Communication Technologies and Services*.

Skills & Abilities

Tools Matlab, Simulink, C/C++, Python, ROS, OpenCV, GStreamer, LabVIEW

Skills Computer Vision, Image/Video Processing, Digital Signal Processing, Embedded Linux, STM32 Embedded Systems Development, Synchronous/Asynchronous Serial Communication, UDP Network Communication, Electronic System Integration and Design, Agile Development

Software SVN, Git, Jira, Confluence, Keil, STMCubeMX, Gazebo, LaTeX, Microsoft Office

Master's Thesis

Title *Metric Scale and 6DoF Pose Estimation Using a Color Camera and Distance Sensors*

- Based on improving performance of a state-of-the-art monocular visual odometry algorithm using 3D point cloud and distance sensor
- Implemented using C++, ROS and open-source autopilot software PX4 on a drone in SIL simulation environment on Gazebo in Linux
- Implementation of monocular visual odometry, PnP pose estimation, low-pass filtering on sensor data and a Kalman filter structure for state estimation
- Conducted lots of literature research on visual odometry/SLAM, 3D reconstruction and Deep learning based pose estimation algorithms

Work Experience

January 2017 – Present
Research & Development Engineer, ASELSAN, Unmanned and Autonomous Systems Design Group, MGEO, Ankara

Worked on micro-size unmanned aerial vehicles

Worked as embedded software engineer

- Worked on C/C++ real-time embedded software development on STM32 F1/F4/F7 MCUs.
- Worked on development of novel autopilot board based on STM32F7x7 MCU. Designed appropriate interfaces for any communication and debugging. Chose navigation sensors like IMUs, GNSS modules, barometers, magnetometers, and temperature, power monitor sensors.
- Implementation of drivers for any needed sensors using UART, I2C and SPI with with needed IT, polling and DMA configurations.
- Implementation of autopilot algorithms, timer scheduling, filtering operations like moving average, low-pass and ramp on sensor data.
- Worked on embedded real-time target specific C++ code generation on Matlab/Simulink.
- Implementation of autopilot algorithms using STM32 Simulink libraries.
- Implementation of autopilot mode logic on StateFlow library of Matlab/Simulink.
- UART and UDP communication implementation on NVIDIA Jetson development boards on Linux.
- Created a C++ code environment on Linux for computer vision purposes alongside with CMake commands and shell scripts.
- Created a Linux for Tegra kernel compilation workspace. Kernel sources and DTS files configured and customized using .patch files and additional DTSi files.

Worked as computer vision engineer

- Implementation of hardware-accelerated real-time video encoding and decoding operations on NVIDIA Jetson development boards using GStreamer pipelines.
- Implementation of real-time video stabilization algorithm using OpenCV in C++.
- Implementation of real-time target tracking algorithm using OpenCV in C++. Using the tracking algorithm, control of a gimbal implemented.
- Implementation of electronic gimbal algorithm using pan, tilt, zoom commands using generic Linux V4L2 drivers of a camera.
- Implementation of a pose estimation algorithm with respect to a known object using OpenCV in Python.
- Implementation of velocity estimation algorithm using optical flow data and distance sensor.

Worked as electronic system design engineer

- Designed electrical and electronic components of an unmanned aerial vehicle.
- Creation of SIL and HIL environments using Gazebo, Intel Stick PC and PixHawk with PX4 software on MAVSDK-Python module.

August – September 2016
Engineering Intern, TURKCELL, Network Technology Group, Ankara.
Design of a Wi-Fi network with master-slave structure.

June – July 2016
Engineering Intern, ASELSAN, Unmanned and Autonomous Systems Design Group, MGEO, Ankara.
Implementation of navigation sensor communication via UART. Design of an algorithm to command gimbal using the sensor data on application written on C#

July – August 2015
Engineering Intern, Erdemir Iron&Steel Factory, Energy Distribution Group, Zonguldak.
Studies on Energy-Generating Resources in the Factory.

Publication

2021 - not published yet **Metric Scale and Angle Estimation in Monocular Visual Odometry with Multiple Distance Sensors**, *Digital Signal Processing: A Review Journal*.
Submitted, got the most positive reviews. Under final review process.

Course Projects

2019 **Analysis of different exploration policies of an agent**, *Probabilistic Robotics*.
Creation of a 2D simulation environment for a ground-object agent with 360° lidar sensor using Python Box2D library. Implementation of different exploration policies and occupancy grip mapping algorithms.

2019 **Spatiotemporal filtering and upsampling of RGB-Depth Cameras**, *Digital Video Processing*.
Sensor fusion of a low resolution depth sensor and high resolution RGB camera data on Matlab with image datasets.

2019 **Comparison of Different LMS Algorithms**, *Adaptive Signal Processing*.
Implementation and comparison of different LMS algorithms on Matlab.

2018 **Analysis of different direction of arrival algorithms**, *Sensor Array Signal Processing*.
Implementation and comparison of DOA algorithms MUSIC, Deterministic and Stochastic Maximum Likelihood Algorithms on Matlab.

2018 **Cue selective binary image segmentation**, *Machine Vision*.
Implementation of background-foreground segmentation of RGB image using depth and color cues on Matlab.

Coursework

- Linear Systems Theory
- Statistical Signal Processing and modelling
- Digital Video Processing
- Sensor Array Signal Processing
- Machine Vision
- Probabilistic Robotics
- Adaptive Signal Processing
- Real-Time Application of Digital Signal Processing

Exams

ALES **Score: 92.95 in 2016**

English Proficiency **METU EPE Score: 87.5 in 2017**

Personal Interests

- Electric Guitar
- Snowboarding
- Running
- Rowing, *METU Rowing Team for 1 year*