Burak Kakillioglu

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Education

P.h D. in Electrical and Computer Engineering	2015 – 2020
Syracuse University, Syracuse, NY, USA	(expected)
Research: 3D vision applications and autonomous UAV guidance by 3D vision	
Advisor: Dr. Senem Velipasalar	
B.Sc. in Electrical and Electronics Engineering	2010 – 2015
Bilkent University, Ankara, TURKEY	

Research

Research Assistant, Smart Vision Systems Lab, Syracuse University	2015 – present

Interests: **3D computer vision** and deep learning.
Secondary: Embedded systems design and development, machine intelligence.
Projects

- 3D object detection via multi-modal sensor fusion from autonomous UAVs
  - Convolutional Multi-Scale 3D Object Detector from Single Shot Captures
- Heat leakage detection from thermal images of the buildings captured by UAVs
- 3D vision-based autonomous drone guidance framework
  - Doorway detection based on 3D point cloud data and color images
  - Accurate and real altitude measurement and autonomous safe landing location detection
  - Highly modular autonomous UAV control and guidance framework

Undergraduate Research

Senior Project, Bilkent University, Electrical and Electronics Engineering Tracking and Predicting Possible Dangers in Mines and Position Tracking for Miners by Using Wireless Sensor Network Advisors: Prof. Nail Akar, Dr. Alper Sarikan	2014 – 2015
Research Project, Bilkent University, Electrical and Electronics Engineering H.264 Video Decoding and Android Application, Part of the project of Ministry of Forestry. Advisor: Prof. Enis Cetin	2015

Publications

Journal Papers

- T. Rakha, **B. Kakillioglu**, et al., "Heat Mapping Drones: An Autonomous Computer Vision-based Procedure for Building Envelope Inspection using Unmanned Aerial Systems (UAS)", *Technology | Architecture + Design (Reviewed. To be appeared.)*	2018

Conference Papers

- **B. Kakillioglu**, Y. Lu, S. Velipasalar, "Convolutional Multi-Scale 3D Object Detector from Single Shot Captures" (*In preparation, to be submitted*)	2018
- M.L. Scalzo, Y. Zheng, **B. Kakillioglu**, S. Velipasalar, "Obstacle Detection and Identification with Portable Uncalibrated Structured Light" (Under revision)	2018
- **B. Kakillioglu**, S. Velipasalar, "Autonomous Altitude Measurement and Landing Area Detection for Indoor UAV Applications" *IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS 2016)*	2016
- **B. Kakillioglu**, K. Ozcan, S. Velipasalar, "Doorway Detection for Autonomous Indoor Navigation of Unmanned Vehicles", *IEEE International Conference on Image Processing (ICIP 2016)*	2016

Professional Experience

Summer Intern, ASELSAN INC.	2014
Underwater Communication System: BPF Design Using FPGA and MATLAB, Interfacing with 24-Bit ADC and DAC, communication protocol	
Summer Intern, Arcelik INC.	2013
R&D TV Design Application intern. RC-5 Com. Protocol, DC-DC Converter Topologies, LVDS Technology, PCB Design with Altium Desginer	

Technical Skills

Software
Very fluent: **Python, C/C++, Matlab**
Fluent: Java, C#, Android, Assembly
Experience in: Bash, VHDL, JavaScript, PHP, CSS, SQL

Tools and APIs
TensorFlow, Keras, OpenCV, Numpy/Scipy, PCL, ROS, pymavlink.

Hardware
Raspberry Pi and similar embedded platforms, Nvidia Jetson, Arduino, Pixhawk Flight Controller, FPGA

OS
Windows, Linux (advanced), OSX (intermediate)

Concepts
Computer vision, machine learning, embedded system design (hw/sw), IoT, signal processing, software engineering, electrical engineering.

Course Highlights
Deep Learning, OOD, Advanced Data Structures and Algorithms, Embedded System Design, Data Mining, Image and Video Processing, Software Modelling, Electronic Circuit Design, Digital Signal Processing, Advances in Deep Learning (enrolled)

Course Projects

Graduate Course Projects	2015 – 2017
• Raspberry Pi based autonomous speaker (person of interest) tracker and camera position control with step motor	
• C# .NET based Test Harness server and client	
• C++ Dependency Analyzer with online code publisher server and repository, user client	
Undergraduate Course Projects	2011 – 2015
• Tracking and Predicting Possible Dangers in Mines and Position Tracking for Miners via Wireless Sensor Network	
• H.264 Video Decoding and Android Application	
• Speech Processing for Android Hearing Aid Application	
• Buck Converter Based Adjustable Voltage Supply	
• Infrared Chat Terminal using 8051 Microprocessor	
• VGA Display Animated Parking System using FGPA	
• TRC-10 AM Band Transceiver Radiotelephone	
• Java Physics Simulator	
Personal Projects	2014
• Wirelessly Controllable Home-Garden Automation System	

Honors and Awards

Honor and High Honor Certificates, Bilkent University Electrical Engineering Department	2011 – 2015
Tuition Scholarship, Bilkent University Electrical Engineering	2010
Top 0.07%, National University Entrance Exam among 1.5m+ candidates	2010

Languages

Turkish (Native)
English (Proficient)
Italian (Elementary)

Service and Outreach

Turkish Student Association at Syracuse University	2015 – present
Executive board secretary	2016
Officer	2015
Bilkent IEEE Student Branch	2010 – 2014

Worked as a volunteer student member. Involved in organization of 100+ events.
Roles:

• Executive Board Mentor	2014
• Executive Board Treasurer	2013
• Webmaster	2012
• Active Member	2011
Chair, Bilkent Robotics Club	2015

Organization of hobby electronics workshops.

Organization Team, Road to University, Bilkent University

An educational program organized by student volunteers and aimed to demonstrate campus life, engineering departments and their work and research areas to high school students from all quarters of Turkey. This 5-day program consists of seminars, laboratory works, conferences, entertaining events and provides awareness in engineering areas before their university preparation period.   2011 – 2015