BURAK KAKILLIOGLU

Ph.D. Candidate / Research Assistant

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RESEARCH PROJECTS

Ph.D. Student / Research Assistant

Smart Vision Systems Lab, Syracuse University

Interests: 3D computer vision, deep learning, embedded systems design, machine intelligence.

August 2015 – Ongoing Syracuse, NY

- 3D patch localization on large-scale point clouds
- 3D object detection via multi-modal sensor fusion from autonomous UAVs
- 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

PROFESSIONAL EXPERIENCE

Intern

SRI International

Developed the algorithm and software for 'Automatic Wood Log Measurement' project using 2D and 3D vision sensors.

June 2019 – August 2019 Princeton, NJ, USA

Visiting Researcher

Automodality Inc.

Developed an autonomous UAV guidance algorithm using 3D sensors.

July 2018 San Rafael, CA, USA

Intern

ASELSAN Inc.

Underwater Communication System: BPF Design Using FPGA and MATLAB, Interfacing with 24-Bit ADC and DAC, communication protocol.

July 2014 Ankara, Turkey

Intern

Arcelik Inc.

R&D TV Design Application intern. RC-5 Com. Protocol, DC-DC Converter Topologies, LVDS Technology, PCB Design with Altium Desginer.

August 2013 Istanbul, Turkey

EDUCATION

Ph.D. in Electrical and Computer Engineering – GPA: 3.89

Syracuse University

Aug 2015 – May 2020 Syracuse, NY, USA

- **Thesis:** 3D computer vision applications and autonomous UAV guidance by 3D computer vision
- **Advisor:** Dr. Senem Velipasalar

B.S. in Electrical and Electronics Engineering

Bilkent University

June 2015 Ankara, Turkey

TECHNICAL SKILLS

Computer Vision | Machine Learning | Deep Learning | IoT | SLAM | Signal Processing | SW Engineering

Python, C/C++, Matlab ●●●●●
Java, C#, Android, Assembly ●●●○○
Bash, VHDL, JS, CSS, SQL ●●○○○

TensorFlow | PyTorch | OpenCV | Numpy | ROS | PCL | PX4/Mavlink | Raspberry Pi | Jetson | Arduino | Pixhawk | FPGA

Linux, Windows ●●●●●
OSX ●●●○○

Git | Continuous Integration

PUBLICATIONS

Journal Articles

- M. Cornacchia, **B. Kakillioglu**, Y. Zheng, and S. Velipasalar (2018). "Deep Learning-Based Obstacle Detection and Classification With Portable Uncalibrated Patterned Light". In: IEEE Sensors Journal, 18.20, pp. 8416–8425.
- T. Rakha, A. Liberty, A. Gorodetsky, **B. Kakillioglu**, and S. Velipasalar (2018). "Heat Mapping Drones: An Autonomous Computer-Vision-Based Procedure for Building Envelope Inspection Using Unmanned Aerial Systems (UAS)". in:*Technology|Architecture+Design* 2.1, pp. 30–44.

Conference Proceedings

- **B. Kakillioglu**, A. Janani, S. Velipasalar, and E. Koch (2019). "3D Sensor-Based UAV Localization for Bridge Inspection". In: (Accepted)*2019 Asilomar Conference*. IEEE.
- **B. Kakillioglu**, A. Ahmad, and S. Velipasalar (2018). "Object Classification from 3D Volumetric Data with 3D Capsule Networks". In: 2018 IEEE Global Conference on Signal and Information Processing (GlobalSIP). IEEE.
- **B. Kakillioglu**, S. Velipasalar, and T. Rakha (2018). "Autonomous Heat Leakage Detection from Unmanned Aerial Vehicle-Mounted Thermal Cameras". In: *Proceedings of the 12th International Conference on Distributed Smart Cameras*. ACM, p. 11.
- M. Cornacchia, Y. Zheng, **B. Kakillioglu**, and S. Velipasalar (2018). "Obstacle Detection and Identification with Portable Uncalibrated Patterned Light", In: *2018 Asilomar Conference*. IEEE.
- **B. Kakillioglu** and S. Velipasalar (2016). "Autonomous altitude measurement and landing area detection for indoor UAV applications". In: Advanced Video and Signal Based Surveillance (AVSS), *2016 13th IEEE International Conference on*. IEEE, pp. 166–172.
- **B. Kakillioglu**, K. Ozcan, and S. Velipasalar (2016). "Doorway detection for autonomous indoor navigation of unmanned vehicles". In: *2016 IEEE International Conference on Image Processing (ICIP)*. IEEE, pp. 3837–3841.

PROJECTS

Graduate Projects

Syracuse University

Several projects of program related courses taken.

Aug 2015 – May 2018 Syracuse, NY, USA

- Continual Learning with Representation Sets
- Study: Playing Atari With Deep Reinforcement Learning
- Embedded autonomous speaker (person of interest) tracker system
- C# .NET based Test Harness server and client
- C++ Dependency Analyzer with online code publisher server and repository, user client

Undergraduate Projects

Bilkent University

Several projects in electrical engineering, signal processing, digital design, analog design, software desing, and networking.

Sept 2011 – June 2015 Ankara, Turkey

HONORS & AWARDS

2^{nd} place on Student Poster Competition
Syracuse COE Symposium

Honor and High Honor Certificates
Bilkent University Electrical Engineering Department

Tuition Scholarship
Bilkent University

Top 0.07%
National University Entrance Exam

SERVICE & OUTREACH

Turkish Student Association at Syracuse University
VP, Executive board secretary, Officer. (2015 – Ongoing)

Bilkent IEEE Student Branch
E-board mentor, E-board treasurer, Webmaster, Member (2010 – 2015). Involved in organization of 100+ technical/career/social events.

Bilkent Robotics Club
Chair (2015). Organization of hobby electronics workshops.

Road to University
Organization Team (2011 – 2014). An educational program for high schools organized by student volunteers.

Reference: **Dr. Senem Velipasalar**
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