# 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.**

October 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

### Visiting Researcher

**Automodality Inc.**

**Algorithm and software developement for 'Automatic Wood Log Measurement' project using 2D and 3D vision sensors.**

June 2019 – August 2019  Princeton, NJ, USA

### Intern

**SRI International**

**3D autonomous UAV guidance algorithm development.**

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*. 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
- Classification of Body Postures and Movements using PUC-Rio Data Set

## 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 among 1.5m+ candidates

# 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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