

OYTUN ULUTAN

oytunulutan@gmail.com

<https://sites.google.com/view/oytun-ulutan>

<https://github.com/oulutan>

Research Interests

Computer Vision, Deep Learning, Machine Learning, Video Analysis

Education

10/2014 - 12/2019 **University of California, Santa Barbara**
Ph.D in Electrical and Computer Engineering in Computer Vision and Machine Learning
Thesis: Attention Models for Activity Detection, **GPA: 3.96**
Advisor: Prof. B.S. Manjunath.

10/2014 - 1/2016 **University of California, Santa Barbara**
M.S in Electrical and Computer Engineering in Signal Processing and Communications.
GPA: 3.96

9/2010 – 6/2014 **Bilkent University, Ankara, Turkey**
B.S in Electrical and Electronics Engineering
GPA:3.80 (High Honors Student)
Awarded Fellowship for all 4 years.

Professional Experience

1/2020 - Present **Zoox, Inc.** Foster City, CA
Position: **Computer Vision Engineer**
Vision Team - Perception
Description: Focusing on pedestrian attribute/gesture and Traffic lights classification on self driving vehicles. Worked on the whole pipeline including problem definition, data mining, labeling, processing, architecture search, model training and implementation. Used Python, C++, Tensorflow and TensorRT.

6/2015 - 12/2019 **Vision Research Lab, University of California, Santa Barbara, CA**
Position: **Graduate Student Researcher**
Advisor: Prof. B.S. Manjunath
Description: "Attention Models for Activity Detection". Worked on state-of-the-art detection tasks such as person/object detection, action detection, complex activity detection using deep neural networks. Novel attention models are used for detection.

6/2018 - 9/2018 **IBM Thomas J. Watson Research Center**, Yorktown Heights, NY
Position: **Summer Research Intern**
Manager: Dr. Mudhakar Srivatsa
Mentor: Dr. Swati Rallapalli
Description: Participated in the ActivityNet-CVPR 2018 in the track AVA: Atomic Visual Action. Created a state of the art Action Detection framework implementing attention mechanisms on videos. Combined this model with object detectors and trackers and achieved a real-time video analysis framework.

6/2017 - 9/2017 **IBM Thomas J. Watson Research Center**, Yorktown Heights, NY
Position: **Summer Research Intern**
Manager: Dr. Mudhakar Srivatsa
Mentor: Dr. Swati Rallapalli
Description: Developed an Action Recognition Pipeline for extracting person tubelets in videos and modeling actions. Participated in the ActivityNet-2017 Challenge within CVPR2017.

1/2017 – 3/2017 **US Army Research Lab (ARL)**, Adelphi, MD
Position: **Research Intern**
Advisor: Dr. Benjamin Riggan
Description: Worked on a feature fusion algorithm for action recognition on UCF101 dataset. The fusion method used Convolutional Neural Networks to extract features from raw RGB images and optical flow.

7/2016 – 8/2016 **US Army Research Lab (ARL)**, Adelphi, MD
Position: **Summer Research Intern**
Advisor: Dr. Benjamin Riggan
Description: Developed a sensor fusion algorithm for person detection in Multi-Modal data. The fusion method used Convolutional Neural Networks for low resolution video cameras and seismic sensors.

1/2015 – 12/2018

ECE Department, University of California, Santa Barbara, CA

Position: **Teaching Assistant**

Description: Led discussion sections, laboratory instruction, graded homeworks, graded exams.

Classes: Deep Learning (**Head TA, Outstanding TA Award**). Digital Image Processing (**Outstanding TA Award**), Computer Vision, Digital Signal Processing, Multimedia Systems, Digital Design Principles.

Select Publications

- **O. Ulutan***, A.S.M. Iftekhar*, B.S. Manjunath, "VSGNet: Spatial Attention Network for Detecting Human-Object Interactions using Graph Convolutions", In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**) 2020, Seattle, WA, 2020
- **O. Ulutan**, S. Rallapalli, C. Torres, M. Srivatsa, and B. Manjunath, "Actor Conditioned Attention Maps for Video Action Detection", In Proceedings of the IEEE Winter Conference on Applications of Computer Vision (**WACV**) 2020, Colorado, USA, 2020
- S. Kumar, C. Torres, **O. Ulutan**, A. Ayasse, D. Roberts, B.S. Manjunath. "Deep Remote Sensing Methods for Methane Detection in Overhead Hyperspectral Imagery", In Proceedings of the IEEE Winter Conference on Applications of Computer Vision (**WACV**) 2020, Colorado, USA, 2020
- Liu, Xiaochen; **Ulutan, Oytun**; Chan, Kevin; Manjunath, B.S.; Govindan, Ramesh; "Caesar: Cross-camera Complex Activity Detection", ACM **SenSYS** 19.
- **O. Ulutan**, B.S. Riggan, N.M. Nasrabadi, B.S. Manjunath, "An Order Preserving Bilinear Model for Person Detection in Multi-Modal Data", Winter Conference on Applications of Computer Vision, (**WACV** 2018).

Workshops/Challenges

- **Oytun Ulutan**, B. S. Manjunath. "UCSB, ActivityNet-AVA Actions Challenge Solution Actor Conditioned Attention Maps for Video Action Detection". UCSB Submission to ActivityNet AVA - CVPRW 2019
- **Oytun Ulutan**, Swati Rallapalli, Mudhakar Srivatsa, B.S. Manjunath. "Joint Classification and Detection Using LSTMs" UCSB & IBM Research Submission to ActivityNet Challenge - CVPRW 2017

Previous Projects

- **Modeling Atomic Actions of Humans using Context:** Surrounding context provides essential information for detecting actions of each actor. To model the surrounding context, we use attention maps which condition the convolutional features to each actor. *In collaboration with IBM Research.*
- **Human-Object Interaction on Images:** Going beyond spatial proximity, detecting human-object interactions with many people/objects is challenging. Our spatial attention maps model such interactions effectively.
- **Detecting Complex Activities from Atomic Actions:** A sequence of atomic actions defines a complex activity. To detect complex activities, we implemented a cross camera framework that combines action detection, object detection, tracking and reidentification. *In collaboration with Army Research Lab, USC*
- **Synthetic Data for Gesture Recognition:** Gesture recognition model for controlling robots by vision. We are analyzing the cases where a small number of training videos are available and synthetic data is utilized for training the models. *In collaboration with Army Research Lab, NASA-JPL*

Key Skills

Proficient Skills:

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| • Python | • C++ |
| • TensorFlow | • Linux |
| • OpenCV | • Git |
| • Latex | |

Skills used in the past:

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|-----------|----------|
| • PyTorch | • C |
| • Caffe | • MATLAB |

Achievements and Distinctions

- Conference Reviewer for **CVPR2018, ACCV2018, Transactions on Multimedia**
- **Funding award from ARL** to support the educational expenses including Tuition, Salary, Insurance and Rent of Winter 2016 Quarter in UCSB. Offer received after exceptional work in Summer Internship in ARL.
- **Deep learning/Computer vision instructor** in a workshop for UCSB and LMU Munich Bio-Physics students.
- Mentored an undergrad intern on a project, "Diabetic Retinopathy Detection Using Deep Neural Networks"
- Turkey Ministry of Industry, **Technical Entrepreneurship Grant (Teknogirisim)**. Grant offer of worth \$50000 to establish a startup for the project "Smart Auditive Device". Project used machine learning and speech recognition methods to develop a customizable device to aid hearing-impaired individuals.
- Dean's **High Honours Student** list for all 4 years in undergraduate education at Bilkent University.
- **Fellowship with stipend** throughout the studies at Bilkent University. Received for achievement in Central University Exam with a rank of **262nd** within over 1.5 million students in nationwide Central University Exam