Burak Uzkent

CONTACT INFORMATION	**Work Address** 346 9th Street. San Francisco, CA, USA 94103	**Phone**: 585-301-0989 **E-mail**: bxu2522@rit.edu **Web**: https://buzkent86.github.io/

DATE OF BIRTH 22/06/1986

NATIONALITY Turkish

RESEARCH INTERESTS Visual Tracking, Object Detection, Image Segmentation, Image Classification, Audio Signal Processing

EDUCATION

Rochester Institute of Technology, Rochester, NY, USA

Ph.D., Chester F. Carlson Center for Imaging Science, August 2011 - June 2016
- Thesis Topic: *Aerial visual vehicle detection and tracking using an adaptive, multi-modal sensor*
- Advisor: Matthew J. Hoffman, Ph.D.
- Co-advisor: Anthony Vodacek, Ph.D.

University of Bridgeport, Bridgeport, CT, USA

M.S., Electrical Engineering, August 2009 - May 2011
- Thesis Topic: *Environmental non-speech sound classification with a new set of time-domain features*
- Advisor: Buket D. Barkana, Ph.D.

Eskisehir Osmangazi University, Eskisehir, Turkey

B.S., Electrical and Electronics Engineering , September 2004 - May 2009
- Thesis Topic: *Autonomous parallel parking of non-holonomic vehicles*
- Advisor: Osman Parlaktuna, Ph.D.

WORK EXPERIENCE

Computer Vision Engineer June 2017 -
Planet Labs, San Francisco, CA

Working on object detection in satellite images using convolutional object detectors. Currently, I am building a large-scale object detection dataset using satellite images, and conducting research to better handle small object detection in low resolution satellite images.

Computer Vision Engineer August 2016 - June 2017
Autel Robotics, San Ramon, CA
Manager: YoungWoo Seo, Ph.D.

Worked on a long-term target following system that will be deployed in the next generation drones. This work involves designing an online learning method to track a single object from a monocular camera at real-time on a low-end embedded plaftorm. Other part of my work includes implementing and testing the tracking algorithm on the embedded platform.

Computer Vision Algorithm Engineer Intern November 2015 - May 2016
Huawei R&D, Bridgewater, NJ
Supervisor: Dong-Qing Zhang, Ph.D.

My internship work was two-folds. First, I designed a subspace learning method to detect strangers in a family photo album using face-only and contextual features learned by fine-tuned Deep Convolutional Neural Networks. In the second step, I designed a probabilistic graph-based approach to assign semantic roles to individuals detected to be family members in the first step.

RESEARCH EXPERIENCE	**Graduate Research Assistant**	April 2012 - June 2016

Graduate Research Assistant   April 2012 - June 2016
Chester F. Carlson Center for Imaging Science,
Rochester Institute of Technology
Supervisor: Matthew J. Hoffman, Ph.D.

Conducted research on aerial vehicle detection and tracking inspired by an adaptive, multi-modal sensor. This work involves developing computer vision and machine learning methods to detect, associate and track ground vehicles in an aerial video. The unique challenges posed by medium-to-high altitude aerial tracking is addressed by efficient use of rich hyperspectral data acquired by an adaptive hyperspectral sensor.

Graduate Research Assistant   May 2014 - June 2014
Chester F. Carlson Center for Imaging Science,
Rochester Institute of Technology
Supervisor: Elizabeth Cherry, Ph.D.

Performed research on 3-D MRI cardiac segmentation. A probabilistic graph-based approach has been proposed to segment the full tissue volume of the heart. A distance term has been incorporated to improve segmentation at the faint boundaries of the heart in MRI slices. The full tissue volume of the heart is required to fully understand the underlying mechanics behind the ventricular fibrillation.

Graduate Research Assistant   August 2009 - May 2011
Electrical Engineering Department,
University of Bridgeport
Supervisor: Buket D. Barkana, Ph.D.

Conducted research on classifying environmental sounds to classify abnormal and normal events. A new, pitch range-based features were proposed to improve the classification. On the classification end, a non-linear Support Vector Machine and Radial Basis Function Neural Network were trained to classify the test data. The results indicate that the new set of low dimensional features leads to higher accuracy rates when they are combined with the conventional Mel-Cepstrum Frequency Coefficients features.

Graduate Research Assistant   January 2009 - May 2009
Electrical and Electronics Engineering Department,
Eskisehir Osmangazi University
Supervisor: Osman Parlaktuna, Ph.D.

Conducted research on autonomous parallel parking of non-holonomic vehicles. Dimensions of a parking lot is sensed by the ultrasonic sensors mounted on a vehicle. Based on the dimensions of a parking lot, parallel parking is accomplished by a few or many repetitions of circular movements.

TEACHING EXPERIENCE

Graduate Teaching Assistant   January 2015 - May 2015
Pattern Recognition, Chester F. Carlson Center for Imaging Science,
Rochester Institute of Technology
Instructor: John Kerekes, Ph.D.

Graduate Teaching Assistant   August 2011 - May 2012
Programming for Imaging Science, Chester F. Carlson Center for Imaging Science
Rochester Institute of Technology
Instructor: Jeff Pelz, Ph.D.

Graduate Teaching Assistant   August 2010 - May 2011
Digital Image Processing, Audio Signal Processing, Speech Signal Processing
Electrical Engineering Department, University of Bridgeport
Instructor: Buket D. Barkana, Ph.D.

Graduate Teaching Assistant   January 2009 - May 2009
Non-linear Control Systems, Electrical and Electronics Engineering Department,
Eskisehir Osmangazi University
Instructor: Osman Parlaktuna, Ph.D.

REFEREED
JOURNAL
PUBLICATIONS

1. **B. Uzkent**, A. Rangnekar, M.J. Hoffman, 'Tracking in Aerial Hyperspectral Videos using Deep Kernelized Correlation Filters', In *IEEE Transactions on Geoscience and Remote Sensing, 2018* (Accepted).

2. **B. Uzkent**, M. J. Hoffman, A. Vodacek, "Integrating Hyperspectral Likelihoods in a Multi-dimensional Assignment Algorithm for Aerial Vehicle Tracking", *IEEE Journal of Selected Topics in Remote Sensing and Observation*, 9(9): 4325–4333, May 2016.

3. **B. Uzkent**, M. J. Hoffman, A. Vodacek, Bin Chen, "Feature Matching with an Adaptive Optical Sensor in a Ground Target Tracking System", *IEEE Sensors Journal*, 15(1): 510–519, January 2015.

4. **B. Uzkent**, B.D. Barkana, H. Cevikalp, "Non-speech environmental sound classification using SVMS with a new set of features", *International Journal of Innovative Computing, Information and Control*, 8(5): 3511–3524, May 2012.

5. B.D. Barkana, **B. Uzkent**, I. Saricicek, "Normal and abnormal non-speech audio event detection using MFCC and PR-based feature sets", *Advanced Materials Research*, Volume 601, pp: 200–208, December 2012.

6. B.D. Barkana, **B. Uzkent**, I. Saricicek, "Environmental noise classifier using a new set of feature parameters based on pitch range", *Applied Acoustics*, 72(11): 841–848, November 2011.

7. **B. Uzkent**, B.D. Barkana, J. Yang, "Automatic environmental noise source classification model using fuzzy logic", *Expert Systems with Applications*, 38(7): 8751–8755, July 2011.

REFEREED
CONFERENCE
PUBLICATIONS

1. **B. Uzkent**, Y. Seo, "*En*KCF: Ensemble of Kernelized Correlation Filters for High-Speed Object Tracking," In *Proceedings of the IEEE Winter Conference on Applications of Computer Vision (WACV)*, pp. 1133-1141, March 2018.

2. **B. Uzkent**, A. Rangnekar, M. J. Hoffman, A. Vodacek, "Aerial Vehicle Tracking by Adaptive Fusion of Likelihood Maps", In *Proceedings of the 13th IEEE Workshop on Perception Beyond the Visible Spectrum, In conjunction with Computer Vision and Pattern Recognition 2017*.

3. **B. Uzkent**, M. J. Hoffman, A. Vodacek, "Real-time Target Detection and Tracking in Aerial Video using Hyperspectral Features," In *Proceedings of the 1st IEEE Workshop on Moving Cameras Meet Video Surveillance: From Body Cameras to Drones, In conjunction with Computer Vision and Pattern Recognition 2016*, pp. 36–44. June 2016.

4. **B. Uzkent**, M. J. Hoffman, A. Vodacek, "Spectral Validation of Measurements in a Vehicle Tracking DDDAS", In *Proceedings of International Conference on Computational Science*, Volume 51, pp. 2493–2502, June 2015.

5. **B. Uzkent**, M. J. Hoffman, A. Vodacek, "Background Image Understanding and Adaptive Imaging for Vehicle Tracking", In *Proceedings of the SPIE 9460, Airborne Intelligence, Surveillance, Reconnaissance (ISR) Systems and Applications XII*, pp. -94600F–94600F-7, April 2015.

6. **B. Uzkent**, M. J. Hoffman, A. Vodacek, "Efficient Integration of Spectral Features for Vehicle Tracking utilizing an Adaptive Sensor", In *Proceedings of the SPIE 9407, Video Surveillance and Transportation Imaging Applications*, pp. 940707–940707-10, February 2015.

7. **B. Uzkent**, M. J. Hoffman, E. Cherry, N. Cahill, "3-D MRI Cardiac Segmentation using Graph Cuts", In *Proceedings of the IEEE Western NY Image Processing Workshop*, pp. 47–51, Rochester, NY, November 2014.

8. **B. Uzkent**, M. J. Hoffman, A. Vodacek, J. P. Kerekes, B. Chen, "Feature matching and adaptive prediction models in an object tracking DDDAS", In *Procedia Computer Science*, Volume 18, pp. 1939-1948, 2013.

9. **B. Uzkent**, B.D. Barkana, "Pitch range-based feature extraction for audio surveillance systems", In *Proceedings of IEEE International Conference on Information Technology: New Generations (ITNG)*, pp. 476–480, April 11-13, 2011.

10. B.D. Barkana, I. Saricicek, **B. Uzkent**, "Performances of the ANN, SVM, and K-means clustering methods recognizing different environmental sounds", In *Proceedings of the 24th European Conference on Operational Research*, Lisbon, Portugal, July 11-14, 2010.

11. **B. Uzkent**, O. Parlaktuna, "Autonomous parallel parking of non-holonomic vehicles", In *Proceedings of the 13th National Conference in Middle East Technical University*, Ankara, Turkey, 2009.

AWARDS
- RIT Graduate Scholarship Award   September 2011 - June 2016
- University of Bridgeport Dean's Scholarship Award   August 2009 - May 2011
- University of Bridgeport Outstanding Student Award   May 2011
- Fulbright Opportunity Grant   August 2009
- Erasmus Exchange Student   September 2007 - January 2008

HARDWARE AND SOFTWARE SKILLS
- C/C++, Python, OpenCV, MATLAB, TensorFlow, Caffe, Linux Shell Scripting, IDL/ENVI, LaTeX, Git, HTML

LANGUAGE PROFICIENCY
- English (Advanced), German (Beginner), Turkish (Native)

REFERENCES

Matthew J. Hoffman, Ph.D.
     Assistant Professor in the Mathematical Sciences Department
     Rochester Institute of Technology   E-mail: mjhsma@rit.edu

Buket D. Barkana, Ph.D.
     Assistant Professor in the Electrical Engineering Department
     University of Bridgeport   E-mail: bbarkana@bridgeport.edu

YoungWoo Seo, Ph.D.
     Engineering Manager
     Hyperloop One   E-mail: youngwoo.blank.seo@gmail.com

Anthony Vodacek, Ph.D.
Associate Professor in the Chester F. Carlson Center for Imaging Science
Rochester Institute of Technology   E-mail: vodacek@cis.rit.edu