BURAK UZKENT

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EDUCATION

Rochester Institute of Technology *August 2011 - May 2016*
Ph.D., Chester F. Carlson Center for Imaging Science
Thesis Topic: Aerial visual vehicle detection and tracking using an adaptive, multi- modal sensor.
Advisor: Matthew J. Hoffman, Ph.D.
Co-Advisors: Anthony Vodacek, Ph.D., John Kerekes, Ph.D.

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

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

WORK EXPERIENCE

Senior Research Scientist *November 2020 -*
Samsung Research America, Mountain View CA
Manager : Hongxia Jin, Ph.D.

Postdoctoral Fellow *July 2018 - October 2020*
Department of Computer Science, Stanford University, Stanford CA
Advisor : Stefano Ermon, Ph.D.
Conducted research on building deep learning models with small data and run-time complexity. Additional research works include building machine learning models for sustainability using different modalities.

Computer Vision Engineer *June 2017 - July 2018*
Planet Labs, San Francisco, CA
Worked on object detection in satellite images using convolutional object detectors and built a large-scale object detection dataset using satellite images, and conducted research to tackle 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 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 platform. Other parts of my work include implementing and testing the tracking algorithm on the embedded system.

Computer Vision Algorithm Engineer Intern *November 2015 - May 2016*
Futurewei Technologies (Huawei R&D), Bridgewater, NJ
Manager: 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 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 - July 2016*
Chester F. Carlson Center for Imaging Science, Rochester Institute of Technology, NY
Advisor: 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.

Graduate Research Assistant *May 2014 - June 2014*
Chester F. Carlson Center for Imaging Science, Rochester Institute of Technology, NY
Advisor: Elizabeth Cherry, Ph.D.
Performed research on 3-D MRI cardiac segmentation to fully understand the underlying mechanics behind the ventricular fibrillation.

Graduate Research Assistant *August 2009 - May 2011*
Electrical Engineering Department, University of Bridgeport, CT
Advisor: 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.

Graduate Research Assistant *January 2009 - May 2009*
Electrical and Electronics Engineering Department, Eskisehir Osmangazi University
Advisor: Osman Parlaktuna, Ph.D.
Conducted research on autonomous parallel parking of non-holonomic vehicles.

TEACHING EXPERIENCE

Teaching Assistant *September 2019 - December 2019*
Data for Development, Department of Computer Science, Stanford University
Instructor: David Lobell Ph.D., Marshall Burke Ph.D., Stefano Ermon Ph.D.

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*, 57(1): 449-461, August 2018. [**Code**]

2. **B. Uzkent**, M. J. Hoffman, A. Vodacek, "Integrating Hyperspectral Likelihoods in a Multi-dimensional Assignment Algorithm for Aerial Vehicle Tracking", *In 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", *In 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", *In 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", *In Advanced Materials Research*, Volume 601, pp: 200208, December 2012.

6. B.D. Barkana, **B. Uzkent**, I. Saricicek, "Environmental noise classifier using a new set of feature parameters based on pitch range", *In Applied Acoustics*, 72(11): 841848, November 2011.

7. **B. Uzkent**, B.D. Barkana, J. Yang, "Automatic environmental noise source classification model using fuzzy logic", *In Expert Systems with Applications*, 38(7): 87518755, July 2011.

REFEREED CONFERENCE PUBLICATIONS

1. K. Ayush, A. Sinha, J. Song, **B. Uzkent**, H. Jin, S. Ermon, "Negative Data Augmentation", *In Proceedings of The International Conference on Learning Representations, ICLR-21*, May 2021.

2. **B. Uzkent**, Kumar Ayush, M. Burke, D. Lobell, S. Ermon, "Efficient Poverty Mapping from High Resolution Remote Sensing Images", *In Proceedings of The Thirty-Fourth AAAI Conference on Artificial Intelligence, AAAI-21*, February 2021.

3. J. Lee, D. Grosz, **B. Uzkent**, S. Zheng, M. Burke, D. Lobell, S. Ermon, "Predicting Livelihood Indicators from Community-Generated Street-Level Imagery", *In Proceedings of The Thirty-Fourth AAAI Conference on Artificial Intelligence, AAAI-21*, February 2021. [**Code**]

4. **B. Uzkent**, Kumar Ayush, M. Burke, D. Lobell, and S. Ermon, "Generating Interpretable Poverty Maps Using Object Detectors in Satellite Images", *In Proceedings of International Joint Conference on Artifical Intelligence, IJCAI-20*, pp. 4410-4416, August 2020.

5. **B. Uzkent**, S. Ermon, "Learning Where and When to Zoom Using Deep Reinforcement Learning", *In Proceedings of the International Conference on Computer Vision and Pattern Recognition, CVPR-20*, pp. 12345-12354, June 2020 (**Oral**). [**Code**]

6. H.L. Aung, **B. Uzkent**, M. Burke, D. Lobell, S. Ermon, "Farmland Parcel Delineation using Spatio-temporal Convolutional Networks", *In Proceedings of the Agriculture-Vision: Challenges Opportunities for Computer Vision in Agriculture, In conjunction with Computer Vision and Pattern Recognition, CVPRW-20*, pp. 76-77, June 2020. [**Code**]

7. **B. Uzkent**, C. Yeh, S. Ermon, "Efficient Object Detection in Large Images Using Deep Reinforcement Learning", *In Proceedings of the IEEE Winter Conference on Applications of Computer Vision, WACV-20*, pp. 1824-1833, March 2020. [**Code**]

8. V. Sarukkai, A. Jain, **B. Uzkent**, S. Ermon, "Cloud Removal fom Satellite Images using Spatiotemporal Generative Networks", *In Proceedings of the IEEE Winter Conference on Applications of Computer Vision, WACV-20*, pp. 1796-1805, March 2020. [**Code**]

9. **B. Uzkent**, E. Sheehan, C. Meng, D. Lobell, M. Burke, S. Ermon, "Learning to Interpret Satellite Images using Wikipedia", *In Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence, IJCAI-19*, pp. 3620-3626, July 2019. [**Code**]

10. E. Sheehan, C. Meng, Matthew Tan, **B. Uzkent**, Neal Jean, D. Lobell, M. Burke, S. Ermon, "Predicting Economic Development using Geolocated Wikipedia Articles", *In Proceedings of the 25TH ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, pp. 2698-2706, July 2019. [**Code**]

11. **B. Uzkent**, Y. Seo, "EnKCF: Ensemble of Kernelized Correlation Filters for High- Speed Object Tracking", *In Proceedings of the IEEE Winter Conference on Applications of Computer Vision, WACV-18*, pp. 1133-1141, March 2018. [**Code**]

12. **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*, pp. 39-48, July 2017.

13. **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.

14. **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.

15. **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. 94600-94607, April 2015.

16. **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. 940707-940717, February 2015.

17. **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, November 2014.

18. **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.

19. **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 2011.

20. 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.

21. **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.

UNDER REVIEW

1. **B. Uzkent**, K. Ayush, C. Meng, M. Burke, D. Lobell, S. Ermon, "Geography-Aware Self-Supervised Learning", *International Conference on Computer Vision and Pattern Recognition*, June 2021.
2. S. Chakraborty, **B. Uzkent**, K. Ayush, E. Sheehan, S. Ermon, "Efficient Conditional Pre-training for Transfer Learning", *IEEE International Conference on Computer Vision and Pattern Recognition*, June 2021.
3. **B. Uzkent**, S. Ermon, "Domain Adaptation Using Adversarial Learning for Studying Low Resolution Images", *IEEE International Conference on Image Processing*, September 2021.

PEER REVIEWS

TGRS, TIFS, NeurIPS, WACV, ICCV, BMVC, TIP, ICML, ICLR, CVPR, IEEE Sensors Journal, Nature Machine Intelligence, IEEE Access

AWARDS

RIT Graduate Scholarship Award	*September 2011 - May 2016*
University of Bridgeport Deans 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

Python, C/C++, MATLAB, PyTorch, TensorFlow, Caffe, OpenCV, Linux Shell Scripting, IDL/ENVI, LaTeX, Git, HTML

LANGUAGE PROFICIENCY

English (Advanced), Turkish (Native)