Waqas Sultani

Contact Information

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Academic Position

Assistant Professor, **2018-Present**

- Computer Science Department, Information Technology University, Lahore

Research Interests

Deep Learning, Computer Vision, Optimization Methods, Weakly supervised Detection, Anomaly Detection, UAV Visual Analysis, Complex Event Detection

Education

Ph.D. Computer Science (Computer Vision), **2011-2017**

- Center for Research in Computer Vision, University of Central Florida, USA
- Advisor: Dr. Mubarak Shah, Trustee Chair Professor
- Dissertation: Weakly Labeled Action Recognition and Detection

MSc. Computer Engineering, **2008-2010**

- Seoul National University, South Korea
- Perceptional and Intelligence lab
- Advisor: Dr. Jin Young Choi

BSc. Electrical Engineering, **2003-2006**

- University of Engineering and Technology, Taxila, Pakistan
- Major: Electronics
- Advisor: Dr. Muhammad Amin

Positions

Assistant Professor **2018- Present**
• Information Technology University, Lahore

Graduate Research Assistant **2011-2017**
• University of Central Florida, USA

Summer Intern **2014**
• Xerox, New York, USA

Lecturer **2010-2011**
• COMSATS University, Islamabad

Advanced Engineering Organization **2007-2008**
• System Design Engineer

Awards, Grants

• **Facebook AI**, Computer Vision for Global Challenges research award, "Low-cost deep learning solution to real-time detection of malaria", Role: PI

• HEC, **Startup Research Grant** Program, "Criminal activities detection in CCTV video using computer vision techniques", Role: PI

• **ICT Research**, "Rotten Vegetable Detection project", Role: PI

• **MS scholarship** by Higher Education Commission, Pakistan

• Recipient of **NSF-USA** Innovation-corps training

• IT Performance **Travel Grant** for CVPR, 2014

• Islamabad College for Boys scholarship for the top position

Consultancy

• SurveyAuto 2019-2020
• DGB Technologies 2019-2020

Patents

• Robert P. Loce, **Waqas Sultani**, Beilei Xu, Hao Wu, "System and Method for Seat Occupancy Detection from Ceiling Mounted Camera using Robust Adaptive Threshold Criteria", **US Patent: US9378421 B2.**

• Robert P. Loce, **Waqas Sultani**, Hao Wu, Beilei Xu, Thomas F. Wade, Mary Ann Sprague, Patricia Swenton-Wall, Megan Clar, Eric Harte, "System and Method for Detecting Settle Down Time using Computer Vision Techniques", **US Patent: US9384396 B2.**

Selected Publications

• Muhammad Waseem Ashraf, **Waqas Sultani**, Mubarak Shah "Dogfight Detecting Drones from Drones Videos", *IEEE Conference on Computer Vision and Pattern Recognition,* ***CVPR****, 2021*

• **Waqas Sultani**, Mubarak Shah "Human Action Recognition in Drone Videos using a Few Aerial Training Examples", *Journal of Computer Vision and Image Understanding,* ***CVIU****, 2021*

• Adnan Qayyum, **Waqas Sultani**, Fahad Shamshad, Junaid Qadir, and Rashid Tufail, "Single-Shot Retinal Image Enhancement Using Deep Image Priors", *International Conference on Medical Image Computing and Computer Assisted Intervention,* ***MICCAI****, 2020*

• Usman Ali, **Waqas Sultani**, Mohsen Ali, "Destruction detection from sky: Weakly supervised apporach for destruction detection in satellite imagery", *Journal of Photogrammetry and Remote Sensing,* ***ISPRS****, 2020*

• Anza Shakeel, **Waqas Sultani**, Mohsen Ali, "Deep built-structure counting in satellite imagery using attention based re-weighting", *Journal of Photogrammetry and Remote Sensing,* ***ISPRS****, 2019*

• **Waqas Sultani**, Chen Chen, Mubarak Shah, "Real-world anomaly detection in surveillance videos", *IEEE Conference on Computer Vision and Pattern Recognition,* ***CVPR****, 2018*

• **Waqas Sultani**, Mubarak Shah, "Automatic Action Annotation in Weakly Labeled Videos", *Journal of Computer Vision and Image Understanding,* ***CVIU****, 2017*

• **Waqas Sultani**, Dong Zhang, Mubarak Shah, "Unsupervised Action Proposal Ranking through Proposal Recombination", *Journal of Computer Vision and Image Understanding,* ***CVIU****, 2017*

• **Waqas Sultani**, Soroush Mokhtari and Hae-Bum Yun, "Automatic Pavement Object Detection using Superpixel Segmentation Combined with Conditional Random Field", *IEEE Transactions on Intelligent Transportation Systems,* ***IEEE Trans ITS****, 2017*

• **Waqas Sultani**, Mubarak Shah, "What if we do not have multiple videos of the same action? - Video Action Localization Using Web Images", *IEEE Conference on Computer Vision and Pattern Recognition,* ***CVPR****, 2016*

• **Waqas Sultani**, Imran Saleemi, "Human Action Recognition across Datasets by Foreground Focused Histogram Decomposition", *IEEE Conference on Computer Vision and Pattern Recognition,* ***CVPR****, 2014*

• **Waqas Sultani**, Jin Young Choi, "Abnormal Traffic Detection using Intelligent Driver Model", *IEEE International Conference on Pattern Recognition,* ***ICPR****, 2010*

• **Waqas Sultani**, Jin Young Choi, "Abnormality Detection in Traffic Scenes", *Summer Conference of Electronics Engineering Society of Korea, 2010*

Related Research Activities

Action Recognition in Aerial videos using few shot learning:
• Developed a human action recognition method for aerial videos using Generative Adversarial Network and Game videos actions on novel datasets.

Destruction Detection in Satellite Imagery:
• Developed a weakly supervised recognition method for destruction detection in satellite imagery.

IARPA Automatic Low Level Analysis and Description of Videos in Diverse Scenario (ALADDIN):
• Developed parallel programs for video feature extraction and performed visual concept detection on computer cluster as an IARPA Aladdin project member • Developed a framework for recognizing human actions on novel datasets.

National Institute of Justice (USA) Anomaly Detection Video Analysis:
• Collected a new video dataset containing criminal activities.
• Collaborated with Orlando Police Department and devised a new crime detection method

Automatic Road Monitoring:
• Developed a new automatic method for pavement object detection.
• Worked on the development of road crack detection software.

Crowd Analysis:
• Worked on use of computational fluid dynamics techniques to solve the particle crowd analysis problems such as crowd segmentation and tracking in dense crowds.

Intelligent Video Surveillance System:
• Proposed a new method for detection of accidents in traffic scenes.
• Worked on implementation of crowd abnormal behaviors detection on video processor TMS320DM6446.

Invited Talks (Selected)

•'Real-world anomaly detection in Surveillance videos' at Lahore University of Management Sciences, Pakistan
•'Action Localization using Web Images' at Criminal Justice Department, University of Central Florida, USA
• 'Recognizing human actions on novel datasets' at Xerox Research Center, USA
• 'Weakly Labeled Action Detection' at Florida Institute of Technology, USA
• 'Automatic Action Annotations' at University of Florida, USA
• 'Weakly Labeled Human Action Recognition' at Punjab University College of Information Technology, Pakistan

Book Chapters

• **Waqas Sultani**, Qazi Ammar Ahmad, Chen Chen "Action Recognition in Real-World Videos", *Computer Vision: A Reference Guide, Springer Link, 2020*

• Sijie Zhu, Chen Chen, **Waqas Sultani** "Video Anomaly Detection for Smart Surveillance", *Computer Vision: A Reference Guide, Springer Link, 2020*

Community Services

• Reviwers of CVPR, ECCV, IEEE TIP, CVIU, IEEE PAMI
•Area Chair in ACM Multimedia Conference, 2021
•Program Chair for Program Committee of WACV, HADCV workshop, 2021
•Area Chair for ACM Multimedia, 2020
•Program Chair for DL-HAU2020, ICPR, 2020
•Area Chair for ACM Multimedia 2020
• Program Committee Member of Frontiers of Information Technology (FIT), 2018

Referees

Dr. Mubarak Shah.
Trustee Chair Professor
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Dr. Ulas Bagci.
Associate Professor
Nnorthwestern university
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Dr. Hae-Bum Yun.
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University of Central Florida
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