

Hyungtae Lee

9263 Wood Violet Ct. Fairfax, VA 22031

e-mail:htlee79@gmail.com

Interests Research scientist position in computer vision and machine learning

Work **DEVCOM Army Research Laboratory** 2014 - present
Experiences *Research Scientist, Federal Employee (2020 - present)*
Research Scientist, Contractor (2014-2020)

Education **University of Maryland, College Park** 2008 - 2014
Ph.D. in Electrical & Computer Engineering.
Advisor: Prof. Larry S. Davis
Thesis: Analyzing Complex Events and Human Actions in “in-the-wild” Videos

Korea Advanced Institute of Science and Technology (KAIST) 2006 - 2008
M.S. in Electrical Engineering.
Advisor: Prof. HyunWook Park
Thesis: Scale-invariant Object Tracking Method Using Strong Corners in the Scale Domain

Sogang University 1999 - 2006
B.S. in Electrical Engineering & Mechanical Engineering (Dual Majors).

Selected **OUSD VARE** 2022 - present
Projects Develop data augmentation methods using novel scene generation from multiple-view images for a variety of computer vision applications (Collaborate with Prof. Manocha, D., UMD).
Related research fields: scene reconstruction (NeRF), data generation (GAN)

IPB Synthetic Data 2020 - present
Develop domain adaptation methods using synthetic images for a variety of computer vision applications (Collaborate with Profs. Torralba, A., MIT, Isola, P., MIT, Guibas, L., Stanford, Chellappa, R., JHU, and Hoffman, J., Georgia Tech).
Related research fields: domain adaptation, data generation (GAN)

DTRA Archangel 2020 - present
Design a pedestrian detection framework in drone view using a novel domain adaptation method that compensates for insufficient views of real images with synthetic images (Collaborate with Prof. Shuvra Bhattacharrya, UMD).
Related research fields: progressive learning, image generation, object detection

IPB Distributed Inference 2018 - present
Develop an integrated multi-view recognition framework that detects objects in real 3D space at each viewpoint and identifies whether objects detected at multiple viewpoints are identical through re-identification.
Related research fields: monocular 3D object detection, re-identification

KIOST Red Tide Detection in GOCI Satellite Images

2016 - 2018

Develop a red tide detection algorithm in which hard examples are generated to address insufficient data caused by the inherently challenging labeling of satellite images.

Related research fields: hard negative generation, hard example mining

DSI Heterogeneous Systems for Information-Variable Environments (HIVE)

2014 - 2016

Develop a novel fusion algorithm that integrates the detection output of various computer vision detection methods with human bio-signals such as EEG and button presses.

Related research fields: information fusion, object detection

Publications *Journals*[6] **Exploring Cross-Domain Pre-trained Model for Hyperspectral Image Classification****Hyungtae Lee**, Sungmin Eum, Heesung Kwon*IEEE Transactions on Geoscience and Remote Sensing (TGRS), 2022*[5] **Generating Hard Examples for Pixel-wise Classification****Hyungtae Lee**, Heesung Kwon, Wonkook Kim*IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS), 2021*[4] **DBF: Dynamic Belief Fusion for Integrating Object Detection Decisions****Hyungtae Lee**, Heesung Kwon*IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2021*[3] **ME R-CNN: Multi-Expert R-CNN for Object Detection****Hyungtae Lee**, Sungmin Eum, Heesung Kwon*IEEE Transactions on Image Processing (TIP), 2020*[2] **Going Deeper with Contextual CNN for Hyperspectral Image Classification****Hyungtae Lee**, Heesung Kwon*IEEE Transactions on Image Processing (TIP), 2017*[1] **A Scale-invariant Object Tracking Method Using Strong Corners in Scale-domain****Hyungtae Lee**, Pyeong Gang Heo, Jung-Yeop Suk, Bo-Yeoun Yeou, and HyunWook Park*SPIE Optical Engineering (OE), 2009**Conferences*[31] **Progressive Transformation Learning for Leveraging Virtual Images in Training**Yi-Ting Shen*, **Hyungtae Lee***, Heesung Kwon, Shuvra Bhattacharyya (* indicates equal contribution.)*IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023 (Highlight, 10% of accepted papers, 2.5% of submissions)*

- [30] **Exploiting Simplified Depth Estimation for Stereo-based 2D Object Detection**
Yaesop Lee*, **Hyungtae Lee***, Eungjoo Lee, Heesung Kwon, Shuvra Bhattacharyya (* indicates equal contribution.)
IEEE Applied Imagery Pattern Recognition Workshop (AIPR), 2022
- [29] **Negative Samples are at Large: Leveraging Hard-distance Elastic Loss for Re-identification**
Hyungtae Lee, Sungmin Eum, Heesung Kwon
European Conference on Computer Vision (ECCV), 2022
- [28] **Self-supervised Contrastive Learning for Cross-domain Hyperspectral Image Representation**
Hyungtae Lee, Heesung Kwon
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2022
- [27] **S-DOD-CNN: Doubly-Injecting Spatially Preserved Object Information for Event Recognition**
Hyungtae Lee, Sungmin Eum, Heesung Kwon
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2020
- [26] **An Optimal End-to-End Training Strategy for Multi-Expert-based Neural Architecture**
Hyungtae Lee, Heesung Kwon
SPIE Defence & Commercial Sensing (DCS), 2020
- [25] **Is Pretraining Necessary for Hyperspectral Image Classification?**
Hyungtae Lee, Sungmin Eum, Heesung Kwon
IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2019
- [24] **DOD-CNN: Doubly-Injecting Object Information for Event Recognition**
Hyungtae Lee, Sungmin Eum, Heesung Kwon
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2019
- [23] **How to Practically Deploy Deep Neural Networks to Distributed Network Environments for Scene Perception**
Hyungtae Lee, Heesung Kwon
SPIE Defence & Commercial Sensing (DCS), 2019
- [22] **Cross-Domain CNN for Hyperspectral Image Classification**
Hyungtae Lee, Sungmin Eum, Heesung Kwon
IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2018
- [21] **Exploitation of Semantic Keywords for Malicious Event Classification**
Hyungtae Lee*, Sungmin Eum*, Joel Levis*, Heesung Kwon, James Machaelis, Michael Kolodny (* indicates equal contribution.)
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2018
- [20] **A Real-time Object Detection Framework for Aerial Imagery Using Deep Neural Networks and Synthetic Training Images**
Priya Narayanan, Christoph Borel-Donohue, **Hyungtae Lee**, Heesung Kwon, Raghuveer Rao
SPIE Defence & Commercial Sensing (DCS), 2018

- [19] **Going Deeper with CNN in Malicious Crowd Event Classification**
Sungmin Eum, **Hyungtae Lee**, Heesung Kwon
SPIE Defence & Commercial Sensing (DCS), 2018
- [18] **IOD-CNN: Integrating Object Detection for Event Recognition**
Sungmin Eum*, **Hyungtae Lee***, Heesung Kwon (* indicates equal contribution.)
IEEE International Conference on Image Processing (ICIP), 2017
- [17] **Enhanced Object Detection via Fusion with Prior Beliefs from Image Classification**
Yilun Cao*, **Hyungtae Lee***, Heesung Kwon (* indicates equal contribution.)
IEEE International Conference on Image Processing (ICIP), 2017
- [16] **Deep Heterogeneous Face Recognition Networks based on Cross-modal Distillation and an Equitable Distance Metric**
Chris Reale, **Hyungtae Lee**, Heesung Kwon
IEEE Conference on Computer Vision and Pattern Recognition Workshop (CVPRW), 2017
- [15] **Deep Network Shrinkage for Cross-Spectrum Face Recognition**
Chris Reale, **Hyungtae Lee**, Heesung Kwon, Rama Chellappa
IEEE International Conference on Automatic Face and Gesture Recognition (FG), 2017
- [14] **Task-conversions for Integrating Human and Machine Perception in a Unified Task**
Hyungtae Lee, Heesung Kwon, Ryan Robinson, Daniel Donavanik, William Nothwang, Amar Marathe
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2016
- [13] **Weakly Supervised Localization Using Deep Feature Maps**
Archith Bency, Heesung Kwon, **Hyungtae Lee**, Karthikeyan Vadivel, B. S. Manjunath
European Conference on Computer Vision (ECCV), 2016
- [12] **Contextual Deep CNN for Hyperspectral Classification**
Hyungtae Lee, Heesung Kwon
IEEE International Geoscience and Remote Sensing Symposium (IGARSS), 2016
- [11] **Single-trial EEG RSVP Classification Using Convolutional Neural Networks**
Jared Shamwell, **Hyungtae Lee**, Heesung Kwon, Amar Marathe, Vernon Lawhern, Amar Marathe
SPIE Defence & Commercial Sensing (DCS), 2016
- [10] **An Efficient Fusion Approach for Combining Human and Machine Decisions**
Hyungtae Lee, Heesung Kwon, Ryan Robinson, William Nothwang, Amar Marathe
SPIE Defence & Commercial Sensing (DCS), 2016
- [9] **DTM: Deformable Template Matching**
Hyungtae Lee, Heesung Kwon, Ryan Robinson, William Nothwang
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2016
- [8] **Dynamic Belief Fusion for Object Detection**
Hyungtae Lee, Heesung Kwon, Ryan Robinson, William Nothwang, Amar Marathe
IEEE Winter Conference on Applications of Computer Vision (WACV), 2016

- [7] **Human-Autonomy Sensor Fusion for Rapid Object Detection**
Ryan Robinson, **Hyungtae Lee**, Amar Marathe, Heesung Kwon, William Nothwang
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015
- [6] **JH2R: Joint Homography Estimation for Highlight Removal**
Sungmin Eum, **Hyungtae Lee**, David Doermann
British Machine Vision Conference (BMVC), 2015
- [5] **Clauselet: Leveraging Temporally Related Actions for Video Event Analysis**
Hyungtae Lee, Vlad I. Morariu, Larry S. Davis
IEEE Winter Conference on Applications of Computer Vision (WACV), 2015
- [4] **Robust Pose Features for Action Recognition**
Hyungtae Lee, Vlad I. Morariu, Larry S. Davis
IEEE Conference on Computer Vision and Pattern Recognition Workshop (CVPRW), 2014
- [3] **Evaluation of LC-KSVD on UCF101 Action Dataset, In THUMOS13 Challenge**
Hyunjong Cho, **Hyungtae Lee**, Zhoulin Jiang
IEEE International Conference on Computer Vision Workshop (ICCVW), 2013
- [2] **Qualitative Pose Estimation by Discriminative Deformable Part Models**
Hyungtae Lee, Vlad I. Morariu, Larry S. Davis
Asian Conference on Computer Vision (ACCV), 2012
- [1] **A Large-scale Benchmark Dataset for Event Recognition in Surveillance Video**
Sangmin Oh, Anthony Hoogs, Amitha Perera, Naresh Cuntoor, Chia-Chih Chen, Jong Taek Lee, Saurajit Mukherjee, JK Aggarwal, **Hyungtae Lee**, Larry Davis et al.
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2011

Professional **Area Chair, Associate Editor, Guest Editor, or Senior Program Committee**

- Services
- AI Conferences: AAAI 2022
 - Remote Sensing (2 special issues)

Reviewer or Program Committee

- Computer Vision Conferences: CVPR 2020~, ECCV 2020~, ICCV 2019~, WACV 2014, 21-2, ACCV 2020, BMVC 2022
- AI Conferences: NeurIPS 2016, 20~, ICLR 2021~, ICML 2021~, AAAI 2020-1
- Document Analysis Conference: ICDAR 2019
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Transactions on Image Processing (TIP)
- Transactions on Machine Learning Research (TMLR)
- IEEE Transactions on Cybernetics (TCYB)
- IEEE Transactions on Geoscience and Remote Sensing (TGRS)
- IEEE Transactions on Artificial Intelligence (TAI)
- IEEE Transactions on Aerospace and Electronic Systems (TAES)
- Computer Vision and Image Understanding (CVIU)
- IEEE Geoscience and Remote Sensing Letters (GRSL)

Scholarship,	· Selected as one of top 10 army technologies (ME R-CNN)	2020
Award, and	· National scholarship, KAIST	2006 - 2008
Honorship	· Summa Cum Laude, Sogang University	2006
	· 6 times academic scholarships, Sogang University	1999 - 2006

Software	· Language: Python, Matlab, C/C++
skills	· Libraries (Deep Learning Tools): PyTorch, Caffe, Tensorflow