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01 Location and Schedule

Location: E1, COEX Convention Center

Date & Time: Sun 27 Oct Full day

SCHEDULE

- 08:30 – 09:00 Welcome and Opening Remarks
- 09:00 – 10:00 Invited Keynote: Real-Time Visual Tracking by Convolutional Neural Networks: A History and The Future
Keynote Speaker: Bohyung Han
- 10:00 – 10:30 Coffee Break
- 10:30 – 11:30 Invited Keynote: Learning to Track and Segment Objects in Videos
Keynote Speaker: Ming-Hsuan Yang
- 11:30 – 12:00 Awarding Ceremony
- 13:30 – 14:00 Winner Talk: Drone Pyramid Networks with adaptive context for Object Detection
- 14:00 – 14:30 Winner Talk: Accurate Target State Estimation for Drone Tracking via Enhanced Data
- 14:30 – 15:00 Winner Talk: Delving into High Quality Detection And Tracking
- 15:00 – 17:00 Poster Session

02 Keynote



Bohyung Han

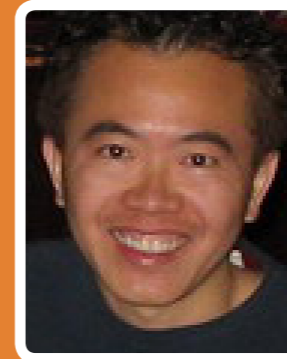
Associate Professor

Department of Electrical and
Computer Engineering
Seoul National University

Title: Real-Time Visual Tracking by Convolutional Neural Networks: a History and the Future

Abstract: Recent tracking algorithms based on convolutional neural networks (CNNs) achieve impressive accuracy, and MDNet is one of the seminal works among them. However, there are still many remaining issues including the efficiency of algorithms and the way to handle challenging situations. In this talk, I will first present several real-time visual tracking algorithms based on CNNs and their characteristics in terms of methodology and performance in recent benchmarks. After that, I will demonstrate the existing limitations in visual tracking algorithms and discuss the potential research directions to handle such challenges.

Biography: Bohyung Han is currently an Associate Professor in the Department of Electrical and Computer Engineering at Seoul National University, Korea. Prior to the current position, he was an Associate Professor in the Department of Computer Science and Engineering at POSTECH and a visiting research scientist in Machine Intelligence Group at Google, Venice, CA, USA. He received the B.S. and M.S. degrees from the Department of Computer Engineering at Seoul National University, Korea, in 1997 and 2000, respectively, and the Ph.D. degree from the Department of Computer Science at the University of Maryland, College Park, MD, USA, in 2005. He served or will be serving as an Area Chair or Senior Program Committee member of numerous major conferences in computer vision and machine learning, a Tutorial Chair in ICCV 2019, and a Demo Chair in ECCV 2022. He is also serving as an Associate Editor in TPAMI and MVA, and an Area Editor in CVIU. He is interested in various problems in computer vision and machine learning with an emphasis on deep learning. His research group won the Visual Object Tracking (VOT) Challenge in 2015 and 2016.



Ming-Hsuan Yang

Professor

Electrical Engineering and
Computer Science Univer-
sity of California, Merced

Title: Learning to track and segment objects in videos

Abstract:

In this talk, I will present our recent results on visual tracking and video object segmentation.

The tracking-by-detection framework typically consists of two stages, i.e., drawing samples around the target object in the first stage and classifying each sample as the target object or as background in the second stage. The performance of existing trackers using deep classification networks is limited by two aspects. First, the positive samples in each frame are highly spatially overlapped, and they fail to capture rich appearance variations. Second, there exists extreme class imbalance between positive and negative samples.

This VITAL algorithm aims to address these two problems via adversarial learning. To augment positive samples, we use a generative network to randomly generate masks, which are applied to adaptively dropout input features to capture a variety of appearance changes. With the use of adversarial learning, our network identifies the mask that maintains the most robust features of the target objects over a long temporal span. In addition, to handle the issue of class imbalance, we propose a high-order cost-sensitive loss to decrease the effect of easy negative samples to facilitate training the classification network. Extensive experiments on benchmark datasets demonstrate that the proposed tracker performs favorably against the state-of-the-art approaches.

Online video object segmentation is a challenging task as it entails to process the image sequence timely and accurately. To segment a target object through the video, numerous CNN-based methods have been developed by heavily fine-tuning on the object mask in the first frame, which is time-consuming for online applications. In the second part, we propose a fast and accurate video object segmentation algorithm that can immediately start the segmentation process once receiving the images. We first utilize a part-based tracking method to deal with challenging factors such as large deformation, occlusion, and cluttered background. Based on the tracked bounding boxes of parts, we construct a region-of-interest segmentation network to generate part masks. Finally, a similarity-based scoring function is adopted to refine these object parts by

comparing them to the visual information in the first frame. Our method performs favorably against state-of-the-art algorithms in terms of accuracy on the DAVIS benchmark dataset, while achieving much faster runtime performance.

Biography: Ming-Hsuan Yang is a research scientist at Google and a professor in Electrical Engineering and Computer Science at University of California, Merced. He received the PhD degree in Computer Science from the University of Illinois at Urbana-Champaign in 2000. He serves as an area chair for several conferences including IEEE Conference on Computer Vision and Pattern Recognition, IEEE International Conference on Computer Vision, European Conference on Computer Vision, Asian Conference on Computer, and AAAI National Conference on Artificial Intelligence. He serves as a program co-chair for IEEE International Conference on Computer Vision in 2019 as well as Asian Conference on Computer Vision in 2014, and general co-chair for Asian Conference on Computer Vision in 2016. He serves as an associate editor of the IEEE Transactions on Pattern Analysis and Machine Intelligence (2007 to 2011), International Journal of Computer Vision, Computer Vision and Image Understanding, Image and Vision Computing, and Journal of Artificial Intelligence Research. Yang received the Google faculty award in 2009, and the Distinguished Early Career Research Award from the UC Merced senate in 2011, the Faculty Early Career Development (CAREER) award from the National Science Foundation in 2012, and the Distinguished Research Award from UC Merced Senate in 2015. He is an IEEE Fellow.

03 Poster

Accepted Paper

Title	Author(s)
How to Fully Exploit The Abilities of Aerial Image Detectors	Junyi Zhang, Junying Huang, Xuankun Chen, Dongyu Zhang
Few-Shot Structured Domain Adaptation for Virtual-to-Real Scene Parsing	Junyi Zhang, Ziliang Chen, Junying Huang, Dongyu Zhang, Liang Lin
SACANet: A Scale-Adaptive Context-Aware Network for Crowd Counting	Haoyue Bai, Song Wen, S.-H. Gary
Learning Cascaded Context-aware Framework for Robust Visual Tracking	Ding Ma, Xiangqian Wu
SlimYOLOv3: Narrower, Faster and Better for Real-Time UAV Applications	Pengyi Zhang, Yunxin Zhong, Xiaoqiong Li
Multi Target Tracking from Drones by Learning from Generalized Graph Differences	Ardö Håkan, Nilsson Mikael

Title	Author(s)
i-Siam: Improving Siamese Tracker with Distractors Suppression and Long-term Strategies	Weiren Tan, Shanghong Lai
Spatial Attention for Multi-scale Feature Refinement for Object Detection	Haoran Wang, Zexin Wang, Meixia Jia, Aijin Li, Tuo Feng, Wenhua Zhang, Licheng Jiao
Real-time Aerial Suspicious Analysis (ASANA) System for the Identification and Re-Identification of Suspicious Individuals using the Bayesian ScatterNet Hybrid (BSH) Network	Singh Amarjot, GV Kranthi Kiran, Harsh Onkar, Kumar Rishav, singh koushlendra, SS Chandra Vamsi
DAReFet: Detecting Indoor Heads using Dual Attention And Refactoring Feature	WenXiang Shen, Pinle Qin, Jianchao Zeng
Deep Adaptive Fusion Network for High Performance RGBT Tracking	Yuan Gao, Chenglong Li, Yabin Zhu, Jin Tang, Tao He, Futian Wang
RRNet: A Hybrid Detector for Object Detection in Drones Captured Images	Changrui Chen, Yu Zhang, Qingxuan Lv, Shuo Wei, Xiaorui Wang, Xin Sun, Junyu Dong
Accuracy and Long-Term Tracking via Overlap Maximization Integrated with Motion Continuity	Wenhua Zhang, Haoran Wang, Zhongjian Huang, Yuxuan Li, Jinliu Zhou, Licheng Jiao
Dense and Small Object Detection in UVA Vision based on Cascade Network	Xindi Zhang
Patch-level Augmentation for Object Detection in Aerial Images	Sungeun Hong, Sungil Kang, Donghyeon Cho
Multi-Object Tracking Hierarchically in Visual Data Taken from Drones	Siyang Pan, Zhihang Tong, Yanyun Zhao
Real-time UAV tracking based on PSR stability	Yong Wang, Lu Ding, Laganiere Robert
Vision-based Online Localization and Trajectory Smoothing for Fixed-wing UAV Tracking a Mobile Target	Yong Zhou
Multiple Object Tracking with Motion and Appearance Cues	Weiqiang Li, Jiatong Mu, Guizhong Liu
Long-term Tracking by Short-term Tracking with Detection	Wu Han, Xueyuan Yang, Yong Yang, Guizhong Liu
A Novel Spatial and Temporal Context-aware Approach for Drone-based Video Object Detection	Zhaoliang Pi, Yanchao Lian, Xier Chen, Yinan Wu, Yingping Li, Licheng Jiao

Result Paper

Title	Author(s)
VisDrone–MOT2019: The Vision Meets Drone Multiple Object Tracking Challenge Results	Longyin Wen, Pengfei Zhu, Dawei Du, Xiao Bian, Haibin Ling, Qinghua Hu, Jiayu Zheng, Tao Peng, Xinyao Wang, Yue Zhang, Liefeng Bo, Hailing Shi, Rui Zhu, Ajit Jadhav, Bing Dong, Brejesh Lall, Chang Liu, Chunhui Zhang, Dong Wang, Feng Ni, Filiz Bunyak, Gaoang Wang, Guizhong Liu, Guna Seetharaman, Guorong Li, Håkan Ardö, Haotian Zhang, Hongyang Yu, Huchuan Lu, Jenq–Neng Hwang, Jiatong Mu, Jinrong Hu, Kannappan Palaniappan, Long Chen, Lu Ding, Martin Lauer, Mikael Nilsson, Noor M. Al–Shakarji, Prerana Mukherjee, Qingming Huang, Robert Laganière, Shuhao Chen, Siyang Pan, Vinay Kaushik, Wei Shi, Wei Tian, Weiqiang Li, Xin Chen, Xinyu Zhang, Yanting Zhang, Yanyun Zhao, Yong Wang, Yuduo Song, Yuehan Yao, Zhaotang Chen, Zhenyu Xu, Zhibin Xiao, Zhihang Tong, Zhipeng Luo, Zhuojin Sun
VisDrone–SOT2019: The Vision Meets Drone Single–Object Tracking Challenge Results	Dawei Du, Pengfei Zhu, Longyin Wen, Xiao Bian, Haibin Ling, Qinghua Hu, Jiayu Zheng, Tao Peng, Xinyao Wang, Yue Zhang, Liefeng Bo, Hailing Shi, Rui Zhu, Bo Han, Chunhui Zhang, Guizhong Liu, Han Wu, Hao Wen, Haoran Wang, Jiaqing Fan, Jie Chen, Jie Gao, Jie Zhang, Jinghao Zhou, Jinliu Zhou, Jinwang Wang, Jiuqing Wan, Josef Kittler, Kaihua Zhang, Kaiqi Huang, Kang Yang, Kangkai Zhang, Lianghua Huang, Lijun Zhou, Lingling Shi, Lu Ding, Ning Wang, Peng Wang, Qintao Hu, Robert Laganière, Ruiyan Ma, Ruohan Zhang, Shanrong Zou, Shengwei Zhao, Shengyang Li, Shengyin Zhu, Shikun Li, Shiming Ge, Shiyu Xuan, Tianyang Xu, Ting He, Wei Shi, Wei Song, Weiming Hu, Wenhua Zhang, Wenjun Zhu, Xi Yu, Xianhai Wang, Xiaojun Wu, Xiaotong Li, Xiaoxue Li, Xiaoyue Yin, Xin Zhang, Xin Zhao, Xizhe Xue, Xu Lei, Xueyuan Yang, Yanjie Gao, Yanyun Zhao, Yinda Xu, Ying Li, Yong Wang, Yong Yang, Yuting Yang, Yuxuan Li, Zeyu Wang, Zhenhua Feng, Zhipeng Zhang, Zhiyong Yu, Zhizhao Duan, Zhuojin Sun

Title	Author(s)
VisDrone–DET2019: The Vision Meets Drone Object Detection in Image Challenge Results	Dawei Du, Pengfei Zhu, Longyin Wen, Xiao Bian, Haibin Ling, Qinghua Hu, Tao Peng, Jiayu Zheng, Xinyao Wang, Yue Zhang, Liefeng Bo, Hailing Shi, Rui Zhu, Aashish Kumar, Aijin Li, Almaz Zinollayev, Anuar Askergaliyev, Arne Schumann, Binjie Mao, Byeongwon Lee, Chang Liu, Changrui Chen, Chunhong Pan, Chunlei Huo, Da Yu, Dechun Cong, Dening Zeng, Dheeraj Reddy Pailla, Di Li, Dong Wang, Donghyeon Cho, Dongyu Zhang, Furui Bai, George Jose, Guangyu Gao, Guizhong Liu, Haitao Xiong, Hao Qi, Haoran Wang, Heqian Qiu, Hongliang Li, Huchuan Lu, Ildoo Kim, Jaekyum Kim, Jane Shen, Jihoon Lee, Jing Ge, Jingjing Xu, Jingkai Zhou, Jonas Meier, Jun Won Choi, Junhao Hu, Junyi Zhang, Junying Huang, Kaiqi Huang, Keyang Wang, Lars Sommer, Lei Jin, Lei Zhang, Lianghua Huang, Lin Sun, Lucas Steinmann, Meixia Jia, Nuo Xu, Pengyi Zhang, Qiang Chen, Qingxuan Lv, Qiong Liu, Qishang Cheng, Sai Saketh Chennamsetty, Shuhao Chen, Shuo Wei, Srinivas SS Kruthiventi, Sungeun Hong, Sungil Kang, Tong Wu, Tuo Feng, Varghese Alex Kollerathu, Wanqi Li, Wei Dai, Weida Qin, Weiyang Wang, Xiaorui Wang, Xiaoyu Chen, Xin Chen, Xin Sun, Xin Zhang, Xin Zhao, Xindi Zhang, Xinyu Zhang, Xuankun Chen, Xudong Wei, Xuzhang Zhang, Yanchao Li, Yifu Chen, Yu Heng Toh, Yu Zhang, Yu Zhu, Yunxin Zhong, Zexin Wang, Zhikang Wang, Zichen Song, Ziming Liu
VisDrone–VID2019: The Vision Meets Drone Object Detection in Video Challenge Results	Pengfei Zhu, Dawei Du, Longyin Wen, Xiao Bian, Haibin Ling, Qinghua Hu, Tao Peng, Jiayu Zheng, Xinyao Wang, Yue Zhang, Liefeng Bo, Hailing Shi, Rui Zhu, Bing Dong, Dheeraj Reddy Pailla, Feng Ni, Guangyu Gao, Guizhong Liu, Haitao Xiong, Jing Ge, Jingkai Zhou, Jinrong Hu, Lin Sun, Long Chen, Martin Lauer, Qiong Liu, Sai Saketh Chennamsetty, Ting Sun, Tong Wu, Varghese Alex Kollerathu, Wei Tian, Weida Qin, Xier Chen, Xingjie Zhao, Yanchao Lian, Yinan Wu, Ying Li, Yingping Li, Yiwen Wang, Yuduo Song, Yuehan Yao, Yunfeng Zhang, Zhaoliang Pi, Zhaotang Chen, Zhenyu Xu, Zhibin Xiao, Zhipeng Luo, Ziming Liu

04 Awards

Task1: object detection in images challenge

Winner

Drone Pyramid Networks–ensemble (DPNet–ensemble)
HongLiang Li, Qishang Cheng, Heqian Qiu, Zichen Song, Xiaoyu Chen
University of Electronic Science and Technology of China, Chengdu, China

Honourable Mention

Re–RegressionNet (RRNet)
Changrui Chen, Yu Zhang, Qingxuan Lv, Xiaorui Wang, Shuo Wei, Xin Sun
Ocean University of China, Qingdao, China

Active Chip Mining for Object Detection(ACM–OD)
Sungeun Hong , Sungil Kang , Donghyeon Cho
SKTBrain, Seoul, South Korea

Task2: object detection in videos challenge

Winner

DeepBlueAI–Detector (DBAI–Det)
Zhipeng Luo, Feng Ni, Yuehan Yao, Bing Dong, Zhenyu Xu
DeepBlue Technology (Shanghai), Beijing, China

Honourable Mention

Augmented Feature Selected RetinaNet (AFSRNet)
Ziming Liu¹, Jing Ge¹, Tong Wu¹, Lin Sun², Guangyu Gao¹
Beijing Institute of Technology, Beijing, China¹
Samsung Inc., San Jose, CA, USA²

Task3: single-object tracking challenge

Winner

Accurate target state estimation for drone tracking (ED–ATOM)
Chunhui Zhang¹, Shengwei Zhao¹, Kangkai Zhang¹, Shikun Li¹, Hao Wen², Shiming Ge¹
Institute of Information Engineering, Chinese Academy of Sciences, Beijing, China¹
CloudWalk Technology Co. Ltd., Guangzhou, China²

Honourable Mention

Accurate Tracking by Overlap Maximization and Feature Recalibration(ATOMFR)
Wenhua Zhang, Haoran Wang, Jinliu Zhou
Xidian university, Xi'an, China

Strategy and Motion Integrated Long–term Experts(SMILE)
Ruiyan Ma, Yanjie Gao, Yuting Yang, Wei Song, Yuxuan Li
Xidian university, Xi'an, China

Task4: multi-object tracking challenge

Winner

DeepBlueAI–Tracker (DBAI–Tracker)
Zhipeng Luo, Yuehan Yao, Zhenyu Xu, Feng Ni, Bing Dong
DeepBlue Technology (Shanghai), Beijing, China

Honourable Mention

Online multi–object tracking using joint domain information in traffic scenarios (TrackKITSY)
Wei Tian¹, Jinrong Hu², Yuduo Song³, Zhaotang Chen², Long Chen², Martin Lauer³
Karlsruhe Institute of Technology, Karlsruhe, Germany¹
Sun Yat–sen University, Guangzhou, P.R.China²
VIPioneers (Huituo) Inc., Guangzhou, P.R.China³

05 Organizer



Pengfei Zhu
Associate Professor
Tianjin University



Longyin Wen
Computer Vision Scientist
JD Digits



Dawei Du
Computer Vision Scientist
University At Albany, SUNY



Xiao Bian
Senior Research Scientist
GE Global Research



Qinghua Hu
Professor
Tianjin University



Haibin Ling
Professor
Stony Brook University

06 Advisory Committee

- Liefeng Bo (JD Digits, USA)
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- David Jacobs (Univ. Maryland College Park, USA)
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- Fuxin Li (Oregon State Univ., USA)
- Anton Milan (Amazon Research and Development Center, Germany)
- Hailin Shi (JD AI Research)
- Siyu Tang (Max Planck Institute for Intelligent Systems, Germany)

07 Organization



08 Collaborator and Sponsor

