LEI KE

HKUST, Clear Water Bay, Hong Kong / Sternwartstrasse 7, Zurich
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EDUCATION

Hong Kong University of Science and Technology (HKUST) *Sept 2019 - Present*
Ph.D. Student in Computer Vision, Computer Science and Engineering
Advisor: Prof.Chi-Keung TANG, IEEE Fellow

ETH Zürich, Switzerland *Jan 2021 - Present*
Visiting Ph.D. Scholar in Computer Vision Lab
Advisor: Prof.Fisher Yu and Dr.Martin Danelljan

Wuhan University, China *Sept 2014 - June 2018*
Bachelor of Software Engineering, Computer Science School GPA: 3.65/4.0, Top 5%

RESEARCH INTEREST

- Image/Video Instance Segmentation & Object Tracking & Video Scene Understanding
- Perception in Open World: Annotation efficiency and semi/un-supervised learning

PUBLICATIONS

Occlusion-Aware Instance Segmentation Via BiLayer Network Architectures.
Lei Ke, Yu-Wing Tai, Chi-Keung Tang.
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), 2023.

Mask-Free Video Instance Segmentation.
Lei Ke, Martin Danelljan, Henghui Ding, Yu-Wing Tai, Chi-Keung Tang, Fisher Yu.
IEEE Conf. on Computer Vision and Pattern Recognition (**CVPR**), 2023.

OVTrack: Open-Vocabulary Multiple Object Tracking.
Siyuan Li, Tobias Fischer, **Lei Ke**, Henghui Ding, Martin Danelljan, Fisher Yu
IEEE Conf. on Computer Vision and Pattern Recognition (**CVPR**), 2023.

Video Mask Transfiner for High-Quality Video Instance Segmentation.
Lei Ke, Henghui Ding, Martin Danelljan, Yu-Wing Tai, Chi-Keung Tang, Fisher Yu.
European Conference on Computer Vision (**ECCV**), 2022.

Mask Transfiner for High-Quality Instance Segmentation.
Lei Ke, Martin Danelljan, Xia Li, Yu-Wing Tai, Chi-Keung Tang, Fisher Yu.
IEEE Conf. on Computer Vision and Pattern Recognition (**CVPR**), 2022.

Prototypical Cross-Attention Networks for Multiple Object Tracking and Segmentation.
Lei Ke, Xia Li, Martin Danelljan, Yu-Wing Tai, Chi-Keung Tang, Fisher Yu.
Advances in Neural Information Processing Systems (**NeurIPS**), 2021
Spotlight presentation.

Deep Occlusion-Aware Instance Segmentation with Overlapping BiLayers.
Lei Ke, Yu-Wing Tai, Chi-Keung Tang.
IEEE Conf. on Computer Vision and Pattern Recognition (**CVPR**), 2021.

Occlusion-Aware Video Object Inpainting.
Lei Ke, Yu-Wing Tai, Chi-Keung Tang.
IEEE International Conf. in Computer Vision (**ICCV**), 2021.

GSNet: Joint Vehicle Pose and Shape Reconstruction with Geometrical and Scene-aware Supervision.
Lei Ke, Shichao Li, Yanan Sun, Yu-Wing Tai, Chi-Keung Tang.

The European Conf. on Computer Vision (**ECCV**), 2020.

Commonality-Parsing Network across Shape and Appearance for Partially Supervised Instance Segmentation.
Qi Fan*, **Lei Ke***, Wenjie Pei, Chi-Keung Tang, Yu-Wing Tai.
The European Conf. on Computer Vision (**ECCV**), 2020.
*** denotes equal contribution.**

Cascaded Deep Monocular 3D Human Pose Estimation with Evolutionary Training Data.
Shichao Li, **Lei Ke**, Kevin Pratama, Yu-Wing Tai, Chi-Keung Tang, Kwang-Ting Cheng.
IEEE Conf. on Computer Vision and Pattern Recognition (**CVPR**), 2020.
Oral presentation.

Reflective Decoding Network for Image Captioning.
Lei Ke, Wenjie Pei, Ruiyu Li, Xiaoyong Shen, Yu-Wing Tai.
IEEE International Conf. in Computer Vision (**ICCV**), 2019.

Memory-Attended Recurrent Network for Video Captioning.
Wenjie Pei, Jiyuan Zhang, Xiangrong Wang, **Lei Ke**, Xiaoyong Shen and Yu-Wing Tai.
IEEE Conf. on Computer Vision and Pattern Recognition (**CVPR**), 2019.

EXPERIENCE

ETH Zürich, Zürich | Visiting PhD Scholar *Jan 2021 - Present*
Advisor: Prof.Fisher Yu and Dr.Martin Danelljan
Working on Image/Video Instance Segmentation & Multiple Object Tracking and Segmentation (MOTS MOTS). The video object tracking and segmentation algorithm handles both **autonomous driving** (BDD100K) and semantically diverse daily scenarios (YouTube-VIS). The efficient MOTS work **PCAN** is accepted by NeurIPS 2021 as spotlight, while the high-quality image/video instance segmentation methods, i.e., **Mask Transfiner** and **VMT**, are published CVPR 2022 and ECCV 2022 respectively.

HKUST, Hong Kong | PhD Student *Sept 2019 - Present*
Advisor: Prof.Chi-Keung TANG and Prof.Yu-Wing TAI
Worked on 3D self-driving scene reconstruction (including joint vehicle pose and dense shape reconstruction from monocular image) & 2D instance segmentation under the partially supervised setting. Both the proposed GSNet and CPMask have been accepted by ECCV 2020. **BCNet** for occlusion-aware instance segmentation is accepted by CVPR 2021. VOIN for occlusion-aware object inpainting is accepted by ICCV 2021.

Tencent Youtu X-Lab, Shenzhen | Reseach Intern *Nov 2017 - Aug 2019*
Advisor: Prof.Yu-Wing TAI
Worked on image and video captioning. Proposed the Reflective Decoding Network (RDN) for image captioning, accepted by ICCV2019, which enhances both the long sequence dependency and position perception of words in a caption decoder, achieving the state-of-the-art performance in both standard and complicated image captioning.

Alibaba Group, Hangzhou | Engineering Intern *June 2017 - Oct 2017*
Worked on the product data mining and recommendation system for Taobao department.

AWARDS

- Most Popular Speakers in TechBeat *2022*
- Research Travel Grant, HKUST/ETH Zurich *2019, 2022*
- Postgraduate Studentship, HKUST *2019-present*
- COMAP's Mathematical Contest in Modeling, Honorable Prize. *2017*
- Excellent Student Scholarship, Wuhan University *2015-2017*
- National Software Design Competition, Second Prize. *2017*
- National Inspirational Scholarship, Wuhan University *2016*

SKILLS AND INTERESTS

- Deep Learning Platform: PyTorch, TensorFlow, Caffe and MXNet
- Language: Mandarin(native), English(fluent)
- Programming Language: Python, C/C++, Java, C#, JavaScript.