

Shu Liu

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EDUCATION

- **The Chinese University of Hong Kong** Hong Kong
Ph.D. Aug. 2014 – Jul. 2018
 - Major: Computer Science and Engineering
 - GPA: **3.91/4.0**
 - Supervisor: *Prof. Jiaya Jia*
 - Thesis: *Object Modeling for Instance Segmentation*
- **Huazhong University of Science and Technology** Wuhan, P.R.China
B.Eng. Sept. 2010 – Jul. 2014
 - Major: Software Engineering
 - Outstanding Student Award (top 1%, the highest honor for undergraduate students in HUST)
 - Overall GPA: **90.85/100**, Major GPA: **93.28/100**
 - Ranking: **1st** out of **229** students

RESEARCH & WORK EXPERIENCE

- **SmartMore** Jan. 2020 – present
Co-founder & Technical Head
 - Topic: Industry AI.
- **Youtu Lab, Tencent** Aug. 2018 – Jan. 2020
Senior Researcher (T3.3, since 2018)
 - Topic: Object Recognition on 2D image and 3D point cloud.
- **Youtu Lab, Tencent** May. 2018 – Aug. 2018
Research Intern (work with Prof. Jiaya Jia)
 - Topic: Object Recognition on 2D image and 3D point cloud.
- **Sensetime** Apr. 2017 – Nov. 2017
Research Intern (work with Dr. Jianping Shi)
 - Topic: Instance segmentation with RGB and RGBD data.
- **Machine Learning Group, University of Toronto** Aug. 2016 – Nov. 2016
Visiting Student (work with Prof. Raquel Urtasun and Prof. Sanja Fidler)
 - Topic: Instance segmentation.
- **Media and Communication Lab, HUST** Oct. 2013 – June 2014
Research Assistant (work with Prof. Xiang Bai and Prof. Yu Zhou)
 - Topic: Object tracking.

RESEARCH INTERESTS

- **Computer Vision and Machine Learning**
 - Object Recognition on Images

- * *Instance Segmentation, Object Detection, Semantic Segmentation, Panoptic Segmentation, Pose Estimation, Image Classification*
- Object Recognition on Point Clouds
 - * *Instance Segmentation, Object Detection, Semantic Segmentation, Panoptic Segmentation*

COMPETITIONS

- 1st place in WAD 2019 3D Object Detection Challenge ¶ 2019
- 1st place in 2018 Scene Understanding Challenge for Autonomous Navigation in Unstructured Environments Instance Segmentation Track† 2018
- 1st place in COCO 2017 Detection Challenge in Instance Segmentation track‡ | slides 2017
- 2nd place in COCO 2017 Detection Challenge in Object Detection track‡ 2017
- 1st place in Large-scale Scene Understanding 2017 Challenge in Instance Segmentation track‡ 2017
- 3rd place in COCO 2015 Detection Challenge in Instance Segmentation track§ 2015

¶ Team X-Team: Zetong Yang, Yanan Sun, **Shu Liu**, Xiaoyong Shen, Yu-Wing Tai, Jiaya Jia

† Team TUTU: Lu Qi, **Shu Liu**, Xiaoyong Shen, Jiaya Jia

‡ Team UCenter: **Shu Liu**, Lu Qi, Haifang Qin, Jianping Shi, Jiaya Jia. We defeat Facebook and MSRA.

§ Team 1026: **Shu Liu** and Xiaojuan Qi.

PUBLICATIONS

- Pengguang Chen, **Shu Liu**, Jiaya Jia. “Jigsaw Clustering for Unsupervised Visual Representation Learning”, *CVPR, 2021*. (**Oral Presentation**)
- Pengguang Chen, **Shu Liu**, Hengshuang Zhao, Jiaya Jia. “Distilling Knowledge via Knowledge Review”, *CVPR, 2021*.
- Zhisheng Zhong, Jiequan Cui, **Shu Liu**, Jiaya Jia. “Improving Calibration for Long-Tailed Recognition”, *CVPR, 2021*.
- Tao Hu, Liwei Wang, Xiaogang Xu, **Shu Liu**, Jiaya Jia. “Self-Supervised 3D Mesh Reconstruction from Single Image”, *CVPR, 2021*.
- Xin Lai, Zhuotao Tian, Li Jiang, **Shu Liu**, Hengshuang Zhao, Liwei Wang, Jiaya Jia. “Semi-supervised Semantic Segmentation with Directional Context-aware Consistency”, *CVPR, 2021*.
- Hui Ying, Zhaojin Huang, **Shu Liu**, Tianjia Shao, Kun Zhou. “EmbedMask: Embedding Coupling for One-stage Instance Segmentation”, *IJCAI, 2021*.
- Zetong Yang, Yanan Sun, **Shu Liu**, Xiaojuan Qi, Jiaya Jia. “CN: Channel Normalization in Point Cloud”, *ECCV, 2020*.
- Ran Chen, Yong Liu, Mengdan Zhang, **Shu Liu**, Bei Yu, Yu-Wing Tai. “Dive Deeper Into Box for Object Detection”, *ECCV, 2020*.
- Zetong Yang, Yanan Sun, **Shu Liu**, Jiaya Jia. “3DSSD: Point-based 3D Single Stage Object Detector”, *CVPR, 2020*. (**Oral Presentation, with acceptance rate as 5%**)
- Li Jiang, Hengshuang Zhao, Shaoshuai Shi, **Shu Liu**, Chi-Wing Fu, Jiaya Jia. “PointGroup: Dual-Set Point Grouping for 3D Instance Segmentation”, *CVPR, 2020*. (**Oral Presentation, with acceptance rate as 5%**)
- Yilun Chen, **Shu Liu**, Xiaoyong Shen, Jiaya Jia. “DSGN: Deep Stereo Geometry Network for 3D Object Detection”, *CVPR, 2020*.
- Weinong Wang, Wenjie Pei, Qiong Cao, **Shu Liu**, Xiaoyong Shen, Yu-Wing Tai. “Orthogonal Center Learning with Subspace Masking for Person Re-Identification”. *TIP, 2020*.

- Zhengtian Xu, **Shu Liu**, Jianping Shi, Cewu Lu. “Outdoor RGBD Instance Segmentation with Attention in Attention”. *TIP*, 2020.
- Zetong Yang, Yanan Sun, **Shu Liu**, Xiaoyong Shen, Jiaya Jia. “STD: Sparse-to-Dense 3D Object Detector for Point Cloud”, *ICCV*, 2019. (**Ranked No. 1 of WAD 2019 3D Object Detection Challenge**)
- Yilun Chen, **Shu Liu**, Xiaoyong Shen, Jiaya Jia. “Fast Point R-CNN”, *ICCV*, 2019.
- Li Jiang, Hengshuang Zhao, **Shu Liu**, Xiaoyong Shen, Chi-Wing Fu, Jiaya Jia. “Hierarchical Point-Edge Interaction Network for Point Cloud Semantic Segmentation”, *ICCV*, 2019.
- Jiequan Cui, Pengguang Chen, Ruiyu Li, **Shu Liu**, Xiaoyong Shen, Jiaya Jia. “Fast and Practical Neural Architecture Search”, *ICCV*, 2019.
- Lu Qi, Li Jiang, **Shu Liu**, Xiaoyong Shen, Jiaya Jia. “Associatively Segmenting Instances and Semantics in Point Clouds”, *CVPR*, 2019.
- Xinlong Wang, **Shu Liu**, Xiaoyong Shen, Chunhua Shen, Jiaya Jia. “Amodal Instance Segmentation through KINS Dataset”, *CVPR*, 2019.
- Lu Qi, **Shu Liu**, Jianping Shi, Jiaya Jia. “Sequential Context Encoding for Duplicate Removal”, *NIPS*, 2018.
- Hengshuang Zhao, Yi Zhang, **Shu Liu**, Jianping Shi, Chen Change Loy, Dahua Lin, Jiaya Jia. “PSANet: Point-wise Spatial Attention Network for Scene Parsing”, *ECCV*, 2018. (**1st place in WAD Drivable Area Segmentation Challenge 2018**)
- **Shu Liu**, Lu Qi, Haifang Qin, Jianping Shi, Jiaya Jia. “Path Aggregation Network for Instance Segmentation”, *CVPR*, 2018. (**Spotlight Presentation, with acceptance rate as 6.7%, 1st place in COCO 2017 Detection Challenge in Instance Segmentation track, 2nd place in Object Detection track**)
- **Shu Liu**, Jiaya Jia, Sanja Fidler, Raquel Urtasun. “SGN: Sequential Grouping Networks for Instance Segmentation”, *ICCV*, 2017.
- **Shu Liu**, Xiaojuan Qi, Jianping Shi, Hong Zhang, Jiaya Jia. “Multi-scale Patch Aggregation (MPA) for Simultaneous Detection and Segmentation”, *CVPR*, 2016. (**Oral Presentation, with acceptance rate as 3.9%**)
- **Shu Liu**, Cewu Lu, Jiaya Jia. “Box Aggregation for Proposal Decimation: Last Mile of Object Detection”, *ICCV*, 2015.
- Cewu Lu, **Shu Liu**, Jiaya Jia, Chi-Kueng Tang. “Contour Box: Rejecting Object Proposals Without Explicit Closed Contours”, *ICCV*, 2015.
- Xiaojuan Qi, Jianping Shi, **Shu Liu**, Renjie Liao, Jiaya Jia. “Semantic Segmentation with Object Clique Potential”, *ICCV*, 2015.
- Xu Min, Yu Zhou, **Shu Liu**, Xiang Bai. “Real-Time Object Tracking via Optimal Feature Subspace”, *ICIP*, 2014.

PREPRINTS & TECHNICAL REPORTS

- Huaijia Lin, Ruizheng Wu, **Shu Liu**, Jiangbo Lu, Jiaya Jia. Video Instance Segmentation with a Propose-Reduce Paradigm. *Tech Report, arXiv*, 2021.
- Jiequan Cui, **Shu Liu**, Zhuotao Tian, Zhisheng Zhong, Jiaya Jia. ResLT: Residual Learning for Long-tailed Recognition. *Tech Report, arXiv*, 2021.
- Pengguang Chen, **Shu Liu**, Hengshuang Zhao, Jiaya Jia. GridMask Data Augmentation. *Tech Report, arXiv*, 2020.
- Jiequan Cui, **Shu Liu**, Liwei Wang, Jiaya Jia. Learnable Boundary Guided Adversarial Training. *Tech Report, arXiv*, 2020.
- Shuqin Xie, Chao Xu, **Shu Liu**, Alan Yuille, Jiaya Jia. TOPNet: Thinking Outside the Bounding Box. *Tech Report, arXiv*, 2019.

- Hong Zhang, Hao Ouyang, **Shu Liu**, Xiaojuan Qi, Xiaoyong Shen, Jiaya Jia. Human Pose Estimation with Contextual Information. *Tech Report, arXiv, 2019*.
- Zetong Yang, Yanan Sun, **Shu Liu**, Xiaoyong Shen, Jiaya Jia. “IPOD: Intensive Point-based Object Detector for Point Cloud”, *Tech Report, arXiv, 2018*.
- **Shu Liu**, Hong Zhang, Di Lin, Jiaya Jia. Instance Segmentation Using Points. *Tech Report, 2017*.

AWARDS

- Hurun China Under 30s To Watch 2020
- Outstanding Reviewer of ICCV 2019
- Graduate Scholarship of The Chinese University of Hong Kong 2014 – 2018
- Outstanding Graduates in HUST 2014
- Second Prize of Excellent Bachelor Thesis in Hubei Province 2014
- Excellent Student Cadre in HUST 2013
- Tencent Merit Scholarship 2013
- First Prize in Hubei Province, Third Prize in China, ‘Lanqiao Cup’ National Software Contest 2012
- Excellent League Member 2012 – 2013
- Outstanding Student Award (top 1%) 2011 – 2014
- Learning Merit Prize 2011 – 2014
- National Scholarship 2011
- Merit Student in HUST 2011

PROFESSIONAL ACTIVITIES

- Reviewer of NeurIPS, ICLR, ICCV, ECCV, CVPR, IJCAI, TPAMI, TOMCCA.
- Invited talk “Computer Vision in Industry Scenario” at CSDN AIProCon 2020.
- Winner presentation in Workshop of Autonomous Driving.
- Invited talk “Path Aggregation Network for Instance Segmentation” in Spotlight Session of CVPR 2018.
- Winner presentation in Scene Understanding Challenge for Autonomous Navigation in Unstructured Environments workshop.
- Winner presentation in COCO and Places Challenges workshop.
- Invited talk “Instance Segmentation with Deep Learning” at Sensetime.
- Winner presentation in Large-Scale Scene Understanding (LSUN) workshop.
- Invited talk “Multi-scale Patch Aggregation (MPA) for Simultaneous Detection and Segmentation” in Oral Session of CVPR 2016.

TEACHING

- 2014 – 2015 / 2015 – 2016 / 2016 – 2017 Spring ENGG2601A Technology, Society and Engineering Practice
- 2014 – 2015 / 2015 – 2016 Fall CSCI1130 Introduction to Computing Using Java