# JINMING SU (苏金明)

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#### ABOUT

I currently work as an algorithm engineer at **Meituan**. I am broadly interested in solving real-world visual understanding problems with optimization/learning-based algorithms. Recently, I focus on developing learning frameworks for **2D/3D computer vision**.

I obtained my Master's Degree (CS) in State Key Laboratory of Virtual Reality Technology and Systems, SCSE, Beihang University, adviced by Prof. Jia Li, in Jan. 2020. From 2018 to 2019, I worked as a research assistant at Peng Cheng Laboratory (PCL) with Dr. Changqun Xia. Before that, I received Bachelor's Degree (CS) from SCSE, Northeastern University, in Jul. 2017.

# **EXPERIENCE**

#### Meituan, Beijing, China

Feb. 2020 – Present

Algorithm Engineer (L7) 2022 - Present

Algorithm Engineer (L6) 2020 – 2022

Focusing on scene understanding for map building, neural rendering and generation for outdoor scenes.

# **m** Project

## **Outdoor NeRF and generation**

Sept. 2022 – Present

Goal: diversity labeled data synthesis and scene simulation

- developed a NeRF system for drone scenes with PSNR 23+, which optimizes the semantic segmentation label and improves the performance of the downstream segmentation model (2+% mIoU)
- developed a NeRF system for street scenes with PSNR 24+ (6 cameras), achieving the state-of-the-art performance
- developing a large AI model for 2D/3D street scenes, to generate corner cases for map building and perception

#### Road scene understanding

Sept. 2020 - Dec. 2022

Goal: improve the automation rate of HD/ADAS/SD map building

- developed a robust and efficient visual perception system, which is featured by:
- with 4 modules, 20+ micro-services
- semantic extraction: semantic segmentation with 70+ classes, including perspective/panoramic views, all elements of maps, high precision/high speed inference and deployment
- instance extraction: instance segmentation, lane detection (accepted by IJCAI 2021), video object tracking
- feature extraction: semantic keypoint extraction and matching, feature descriptor extraction and matching
- monocular 3D vision: monocular depth estimation and visual 3D reconstruction, including perspective/panoramic views
- Result: applied to the production of HD map, ADAS map in Beijing, HD map almost the whole country
- Extra: developed an intelligent segmentation annotation system, and published two papers on instance segmentation, and video semantic segmentation in CVPRW 2023

## Image quality assessment

Feb. 2020 – Aug. 2020

Goal: filter invalid images to improve the success rate of the map building

- developed a robust image quality assessment system
- judgment and filtering 10+ kinds of invalid images, e.g. Overexposure, night and traffic jam
- Result: check all images (billions of images every year) used to produce HD map with 100% automation rate of image audit

## **EDUCATION**

#### Beihang University (BUAA), Beijing, China

Sept. 2017 – Jan. 2020

M.Sc. in Computer Science and Technology, ranked 9/303, top 3.0%

- State Key Laboratory of Virtual Reality Technology and Systems, SCSE
- Advisor: Prof. Jia Li

#### Northeastern University (NEU), Shenyang, China

Sept. 2013 - Jul. 2017

B.Eng. in Computer Science and Technology, ranked 10/258, top 3.9%

- Recommended for admission to Beihang University without exams

#### **■** SELECTED PUBLICATIONS

- Jinming Su\*, Ruihong Yin\*, Shuaibin Zhang and Junfeng Luo. Motion-state Alignment for Video Semantic Segmentation. *IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2023.
- Jinming Su, Ruihong Yin, Xingyue Chen and Junfeng Luo. Perceive, Excavate and Purify: A Novel Object Mining Framework for Instance Segmentation. *IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2023.
- Jia Li, <u>Jinming Su</u>, Changqun Xia, Yonghong Tian. Salient Object Detection with Purificatory Mechanism and Structural Similarity Loss. *IEEE Transactions on Image Processing (T-IP)*, 30, pp.6855-6868, 2021.
- Jinming Su, Chao Chen, Ke Zhang, Junfeng Luo, Xiaoming Wei and Xiaolin Wei. Structure Guided Lane Detection. *International Joint Conference on Artificial Intelligence (IJCAI)*, 2021.
- Jinming Su, Changqun Xia and Jia Li. Exploring Driving-aware Salient Object Detection via Knowledge Transfer. *IEEE International Conference on Multimedia and Expo (ICME)*, 2021. (oral)
- Jia Li, **Jinming Su**, Changqun Xia, Yonghong Tian. Distortion-adaptive Salient Object Detection in 360° Omnidirectional Images. *IEEE Journal of Selected Topics in Signal Processing (J-STSP)*, 14(1), pp.38-48, 2020.
- Jinming Su, Jia Li, Yu Zhang, Changqun Xia and Yonghong Tian. Selectivity or Invariance: Boundary-aware Salient Object Detection. *IEEE International Conference on Computer Vision (ICCV)*, 2019.
- Junwei Yang, Ke Zhang, Zhaolin Cui, **Jinming Su**, Junfeng Luo and Xiaolin Wei. InsCon:Instance Consistency Feature Representation via Self-Supervised Learning. *arXiv preprint arXiv:2203.07688*, 2022.
- Changqun Xia, Jia Li, **Jinming Su** and Yonghong Tian. Relating Background to Foreground: Exploring Reciprocal Attention for Salient Object Detection by Cooperative Learning. *arXiv* preprint arXiv:1909.08269, 2019.
- Changqun Xia, Jia Li, **Jinming Su** and Ali Borji. Learning a saliency evaluation metric using crowdsourced perceptual judgments. *arXiv preprint arXiv:1806.10257, 2018.*
- Patents: 16 items is in applications and 6 is issued (1 in the United States).

## SKILLS

- Specialize in deep learning for computer vision, including NeRF, visual 3D reconstruction, road scene understanding, visual saliency, and so on.
- good at academic writing and presentation, CET6
- Familiar with deep learning libraries Pytorch/Caffe

# **★** Projects & Activities

- Journal reviewer of T-PAMI, T-CSVT, T-IV
- Conference reviewer of CVPR, ICCV, ECCV
- Teaching assistant for Machine Learning and Its Engineering Foundation at BUAA, Spring 2018
- Designed and developed the official website of CVTEAM laboratory http://cvteam.net
- Participated in the design and development of program online judge platform for NEU https://oj.neu.edu.cn

- Member of the ACM-ICPC team of NEU
- Github: https://github.com/Jinming-Su
- Old blog: https://blog.csdn.net/u014451076
- Homepage: http://jinmingsu.net

#### COMPETITIONS

- 3th place of Video Panoptic Segmentation Challenge in the 2nd PVUW, CVPR, 2023
- 6th place of Video Semantic Segmentation Challenge in the 2nd PVUW, CVPR, 2023
- 2nd place of BDD100K Multiple Object Tracking Challenge in the 2nd SSLAD Workshop, ECCV, 2022
- 1st place of Corner Case Detection Challenge in the 2nd SSLAD Workshop, ECCV, 2022
- 5th place of Video Object Segmentation Challenge in the 4th Youtube-VOS Workshop, CVPR, 2022
- 2nd prize of the National English Competition for College Students, 2015
- 1st prize of the Liaoning Province ACM-ICPC Contest, 2015
- 1st prize of the Liaoning Province ACM-ICPC Contest, 2014
- 2nd prize of the China Undergraduate Mathematical Contest in Modeling, 2014
- 3rd prize of the Northeast Region ACM-ICPC Contest, 2014

#### ■ SELECTED HONOURS

- Star of Basic Research and Development Business Group (10 of 2000+), Meituan, 2022
- Star of Intelligent Traffic Business Group (39 of 2000+), Meituan, 2021
- Outstanding Master Graduate of Beijing, 2020
- Outstanding Master Graduate Thesis of BUAA, 2020
- National Scholarship, 2019
- Huawei Scholarship, 2019
- Outstanding Student of BUAA, 2019
- Merit Student of BUAA, 2018/2019
- First Class Scholarship of Excellent Student in BUAA, 2017-2019
- Outstanding Undergraduate Thesis of NEU, 2017
- National Encouragement Scholarship, 2014-2016
- The Zhou Kun Scholarship, 2013-2016
- Excellent Student of NEU, 2014/2015
- Outstanding Individual of Scientific and Technological Innovation of NEU, 2014