Depu Meng (孟德普)

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4th-year Ph. D. student • HomePage • GitHub • LinkedIn • Google Scholar
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Education

University of Science and Technology of China - Microsoft Research Asia — Beijing, China
Joint Ph. D. student in Automation — *Sept. '18 – present*
Advisors: Dr. Baining Guo, Prof. Houqiang Li

University of Science and Technology of China — Hefei, Anhui, China
B.S. in Electrical Engineering (School of Gifted Young) — *Sept. '14 – Jun. '18*

Work Experience

Meituan — Beijing, China
Research Intern, Autonomous Delivery Group — *Aug. '21 – present*
Mentor: Dr. Changqian Yu

Microsoft Research Asia — Beijing, China
Research Intern, Visual Computing Group — *Jul. '19 – Jul. '21*
Mentor: Dr. Jingdong Wang

Microsoft Research Asia — Beijing, China
Research Intern, Visual Computing Group — *Jul. '17 – Jul. '18*
Mentor: Dr. Jingdong Wang

Research Interests

Autonomous driving: 3D perception and interaction prediction. I am passionate in autonomous driving research. I am very interested in intention/interaction prediction of agents in traffic scenes. I am also interested in joint perception and motion prediction from LiDAR point cloud data, as well as multi-modal 3D object detection. I am looking forward to work opportunities on perception problems in autonomous driving industry.

Publications

Depu Meng, Changqian Yu, Deheng Qian, Houqiang Li, Dongchun Ren.
HyMo: Hybrid Motion Representation Learning for Prediction from Raw Sensor Data.
In submission.

Changqian Yu, **Depu Meng**, Deheng Qian, Dongchun Ren.
PolarMotion: Multimodal Motion Prediction with Polar Anchors.
In submission.

Depu Meng*, Xiaokang Chen*, Zejia Fan, Yuhui Yuan, Gang Zeng, Houqiang Li, Lei Sun, Jingdong Wang.
Conditional DETR for Fast Training Convergence.
ICCV 2021.

Depu Meng, Zigang Geng, Zhirong Wu, Bin Xiao, Houqiang Li, Jingdong Wang.
Consistent Instance Classification for Unsupervised Representation Learning.
ICCV 2021 Workshop: Self-supervised Learning for Next-Generation Industry-level Autonomous Driving.

Ke Sun, Zigang Geng, **Depu Meng**, Bin Xiao, Dong Liu, Zhaoxiang Zhang, Jingdong Wang.
Bottom-Up Human Pose Estimation by Ranking Heatmap-Guided Adaptive Keypoint Estimates.
Tech Report.

Liming Zhao, Mingjie Li, **Depu Meng**, Xi Li, Zhuowen Tu, Zhaoxiang Zhang, Yueting Zhuang, J. Wang.
Deep Convolutional Neural Networks with Merge-and-Run Mappings.
IJCAI 2018.

Research Experience

Multi-modal 3D Object Detection *Feb. '22 – present*

- We are studying on how to build efficient multi-modal (e.g., LiDAR + RGB) 3d object detection framework. We are trying to figure out what information from RGB is important and complementary to LiDAR data for 3d object detection. (Working in progress).

Joint Perception and Motion Prediction from Raw Sensor Data *Aug. '21 – Jan. '22*

- We propose a framework that jointly performs instance-wise motion (global motion) prediction and point-wise motion (local motion) prediction. We find out that global motion prediction and local motion prediction can mutually benefit from each other. (In submission).

Transformer based Object Detection *Dec. '20 – Jul. '21*

- Identify and solve the slow training convergence problem in DETR. Introduce conditional spatial embedding to dynamically shrink the search space of cross-attention to object extremities and region inside objects. $10\times$ training speed-up is achieved. (Accepted by ICCV 2021).

Unsupervised Representation Learning *Apr. '20 – Oct. '20*

- Study the instance classification method in unsupervised representation learning. Propose a consistent instance classification method to ease the optimization difficulty in instance classification. Verify the quality of learned representations on varies down-stream tasks: object detection, instance segmentation, semantic segmentation, pose estimation. (Accepted by ICCV Workshop 2021).

Real-time Semantic Segmentation *Dec. '19 – Mar. '20*

- Build a high-efficiency semantic segmentation network based on HRNet. The model is shipped to Microsoft Form Recognizer for Table Segmentation.

Engineering Experience

Deep Learning GUI Development Microsoft Research Asia

Front-end developer *Oct. '17 – Dec. '17*

- UWP based front-end, Python based back-end software. Use Keras as deep learning platform.
- Support remote connection, GUI-based model building, editing, saving, loading for plain CNN architectures. Support loss curve display.
- Project is open-source: github.com/NNBaby/NNUI

Awards

Star of Tomorrow Internship Award, Microsoft Research Asia *Jul. '18*

The AEGON-INDUSTRIAL Fund Scholarship, USTC *Oct. '15*

Talks

"An introduction to joint perception and prediction", Autonomous Delivery Group, Meituan, 2021

"Joint perception and prediction for autonomous driving", MTL, University of Michigan, Ann Arbor, 2021

Services

Conference Reviewer: CVPR 2022, ECCV 2022