

Algorithm-System-Hardware Co-Design for Efficient Point Cloud Processing

Team at MIT: Zhijian Liu, Haotian Tang, Yujun Lin, Song Han

- **Achievements in the past quarter:**
 - Paper acceptance:
 - BEVFusion is accepted to ICRA 2023.
 - FlatFormer and SparseViT are accepted to CVPR 2023.
 - Extended BEVFusion to camera-radar fusion:
 - Achieved 5% higher mAP than the state-of-the-art FUTR3D.
 - Deployed on Nvidia Jetson AGX Orin (with real-time inference).
 - Improved the accuracy of FlatFormer on Waymo test and nuScenes val.
 - Prepared the book chapter for “Towards Realistic 3D Deep Learning: Algorithms and Applications”.

Interpretable & Scalable Geometric Deep Learning

Team at GT&Purdue: Siqi Miao, Haoteng Yin, Jiajun Zhu, Mia Liu, Pan Li

- **Achievements in last quarter:**
 - Interpretable Point Cloud models (LRI)
 - Accepted to ICLR'23
 - Benchmarking and rethinking interpretable models in GDL
 - Scalable geometric deep learning (GDL)
 - Tested subgraph-based approaches on super-large graphs
 - Tested multiple sparsity types of graph construction/graph transformers on the tracking and the pileup mitigation dataset, i.e., local, latent, low-rank
- **Plans in April:**
 - Rethink problems of interpretable models in GDL with carefully designed experiments
 - Comprehensively benchmark scalable GDL models on 4 scientific datasets

Domain Adaptation on Graph Machine Learning & OOD

Team at GT&Purdue: Shikun Liu, Tianchun Li, Yongbin Feng (Fermi), Nhan Tran (Fermi), Han Zhao (UIUC), Qiang Qiu, Pan Li

OOD team: Deyu Zou, Siqi Miao, Shikun Liu, Pan Li, Shiyu Chang (UCSB)

- **Achievements in last quarter:**

- StruRW project
 - Finish the paper submission and rebuttal for ICML 2023 submission
 - Prepare the experiments for the arxiv version
- OOD project
 - Explore the data generation process and different shifts in HEP datasets and material science datasets
 - Try some preliminary OOD baselines
 - Currently focus on the shift in terms of calculation methods with different fidelity in the QMOF dataset. Explore the inductive transfer learning baseline for the concept shift (pretraining and fine-tuning)

- **Plan in April:**

- Publish the arxiv version of the StruRW paper
- Finalize the datasets and shifts we want to focus in OOD project and benchmark some baseline performance