Summary of the Kick-off Meeting --- HAC

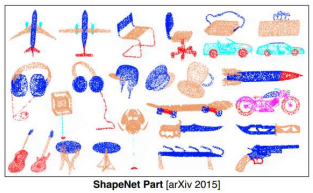
A3D3 HAC Leading Faculties ---

Deming Chen, Song Han, Scott Hauck, **Pan Li**

HAC Talks

- Point cloud models based on point-voxel convolution --- Zhijian Liu

Results: 3D Object Part Segmentation



ShapeNet Part [arXiv 2015]

Results: 3D Outdoor Scene Segmentation

SemanticKITTI [ICCV 2019]

- Graph models for $\tau \rightarrow 3\mu$ detection --- Siqi Miao
  - Trigger Acceptance Rate@30kHz Trigger Rate:
    - MLP: 0.210
    - GNN: 0.953
  - Graph construction is the computational bottleneck.

- HLS4ML Overview --- Dylan Rankin
  - Supports for RNNs and GNNs are still under development

- ScaleHLS: Scalable HLS on multi-level intermediate representation --- Hanchen Ye
  - GitHub Repository: https://github.com/hanchenye/scalehls
  - IP Integration
  - Design Space Exploration
  - Design Verification
  - RTL Code Generation

Identified Projects (till 6PM (ET) Nov. 9th)

- 8/9 projects mention the area “hardware and algorithm”
- 5 identified projects (led by HAC leading faculties)
  - Algorithm-System-Hardware Co-Design for Efficient Point Cloud Processing --- MIT
  - Point Cloud Neural Network Interpretation --- Purdue
  - Domain Adaptation for Graph Machine Learning --- Purdue
  - ScaleHLS: A New Scalable High-Level Synthesis Framework on Multi-Level Intermediate Representation --- UIUC
  - PyLog: An Algorithm-Centric Python-Based FPGA Programming and Synthesis Flow --- UIUC
- Check the overleaf doc for more descriptions

Students

- 10 HAC students (3 master, 7 PhD students) get involved.
  - UIUC: Hanchen Ye, Tim Zhang
  - UW: Xiaohan Liu (neuroscience)
  - Purdue: Shikun Liu (HEP), Tianchun Li (HEP), Siqi Miao (HEP), Rongzhe Wei
  - MIT: Zhijian Liu (HEP), Haotian Tang, Yujun Lin

Students Engagement

- Slack channel (a3d3-HAC), missing two students yet
- Quarterly meeting among HAC faculty leaders Time (TBD)
- Monthly meeting between each student project leader and the coordinator. Student leaders prepare a report if necessary.

Interdisciplinary Research

- Keep current collaborations
  - Song Han (HEP)
  - Pan Li (HEP)
  - Scott Hauck (Neuroscience)
- Look for more…
  - Feel free to contact me or other HAC faculties
  - Let us know what you need…