Chenhongyi Yang

chenhongyi.yang@ed.ac.uk | ChenhongyiYang | chenhongyiyang.com

Education

University of Edinburgh Mar. 2021 – Present
PhD in Engineering Supervisor: Dr. Elliot J. Crowley

Boston University Sep. 2018 – May 2020
MSc in Computer Science Supervisor: Prof. Margrit Betke

University of Science and Technology of China Sep. 2014 – June 2018
BEng in Computer Science and Technology

Industry Experiences

Meta | *Research Scientist Intern* June 2023 – Mar. 2024

- Egocentric 3D Human Pose Estimation. Developed the first transformer for egocentric body pose estimation. It achieved a 42% less error compared to Meta's production model on the internal benchmark. On the public UnrealEgo dataset, it outperformed the previous state-of-the-art with 45% less error and 13.1% FLOPs. (EgoPoseFormer - Preprint)

TuSimple | *Research Intern* May 2020 – Feb 2021

- Efficient Small Object Detection. Introduced a sparse computing mechanism designed to enhance the speed of small object detection using high-resolution feature maps. The mechanism, when tested on the public COCO dataset, allowed the detection model to operate 3.2× faster while maintaining accuracy with minimal loss. (QueryDet - CVPR 2022)
- Open-sourced Software. Extended the open-sourced SimpleDet toolkit by integrating the latest detection techniques.

Research Experiences

BayesWatch Group, University of Edinburgh | *PhD Student* Mar. 2021 – Present

- General Visual Recognition. **(1)** Developed a high-resolution, non-hierarchical vision transformer for general visual recognition. The new architecture achieved much better performance than previous models accross various downstream tasks. (GPViT - ICLR 2023); **(2)** Introduced a simple Mamba architecture as an image encoder. With linear complexity relative to the input size, it outperformed the vision transformer on different downstream tasks. (PlainMamba - Preprint)
- Efficient Training for Visual Recognition Models. **(1)** Developed a model-independent active learning algorithm for object detection, surpassing the performance of all prior methods.(PPAL - CVPR 2024); **(2)** Designed a state-of-the-art and highly generalizable knowledge distillation (KD) approach for object detection, utilizing the teacher model's performance to guide the computation of KD loss. (PGD - ECCV 2022); **(3)** Introduced an unsupervised pre-training paradigm for instance-level tasks, employing contrastive loss computed with regional visual features. (CCOP - Preprint)
- Robust Transformer for BEV View-transformation. Designed a transformer to convert multi-view image features into a unified BEV representation. The transformer processes compressed visual features as inputs and is composed of a single standard cross-attention layer, making it robust, efficient, and deployment-friendly. (WidthFormer - Preprint)

IVC Lab, Boston University | *Research Assistant* Jan. 2019 – May 2020

- Detecting Heavily Occluded Objects. Introduced a novel non-maximum suppression (NMS) algorithm that significantly enhanced the detection recall for heavily occluded objects. Benchmarking on the KITTI and CityPersons datasets confirmed the algorithm's efficacy. (SG-NMS - ECCV 2020)

Services

- **Conference Reviewer**: CVPR, ICCV, ECCV, NeurIPS, ICLR, BMVC
- **Journal Reviewer**: TIP, TNNLS, TCSVT, TMM

Publications

- **Chenhongyi Yang**, Lichao Huang, Elliot J. Crowley, "Plug and Play Active Learning for Object Detection", CVPR 2024
- Jiahao Chang*, Shuo Wang*, Haiming Xu, Zehui Chen, **Chenhongyi Yang**, Feng Zhao, "DETRDistill: A Universal Knowledge Distillation Framework for DETR-families", ICCV 2023
- **Chenhongyi Yang***, Jiarui Xu*, Shalini De Mello, Elliot J. Crowley, Xiaolong Wang, "GPViT: A High-Resolution Non-Hierarchical Vision Transformer with Group Propagation", ICLR 2023 ***Spotlight Presentation***
- **Chenhongyi Yang**, Mateusz Ochal, Amos Storkey, Elliot J. Crowley, "Prediction-Guided Distillation for Dense Object Detection", ECCV 2022
- **Chenhongyi Yang**, Zehao Huang, Naiyan Wang, "QueryDet: Cascade Sparse Query for Small Object Detection", CVPR 2022 ***Oral Presentation***
- Zehui Chen*, **Chenhongyi Yang***, Qiaofei Li, Feng Zhao, Zheng-Jun Zha, Feng Wu, "Disentangle Your Dense Object Detector", ACM Multimedia 2021 ***Oral Presentation***
- Zehui Chen, **Chenhongyi Yang**, Qiaofei Li, Feng Zhao, Zheng-Jun Zha, Feng Wu, "DDOD: Dive Deeper into the Disentanglement of Object Detector", IEEE Transactions on Multimedia
- Kaihong Wang, **Chenhongyi Yang**, Margrit Betke, "Consistency Regularization with High-dimensional Non-adversarial Source-guided Perturbation for Unsupervised Domain Adaptation in Segmentation", AAAI 2021
- **Chenhongyi Yang**, Vitaly Ablavsky, Kaihong Wang, Qi Feng, Margrit Betke, "Learning to Separate: Detecting Heavily-Occluded Objects in Urban Scenes", ECCV 2020

Preprint Papers

- **Chenhongyi Yang***, Zehui Chen*, Miguel Espinosa*, Linus Ericsson, Zhenyu Wang, Jiaming Liu, Elliot J. Crowley, "PlainMamba: Improving Non-Hierarchical Mamba in Visual Recognition", Preprint 2024 (arXiv:2403.17695)
- **Chenhongyi Yang**, Anastasia Tkach, Shreyas Hampali, Linguang Zhang, Elliot J. Crowley, Cem Keskin, "EgoPoseFormer: A Simple Baseline for Egocentric 3D Human Pose Estimation", Preprint 2024 (arXiv:2403.18080)
- **Chenhongyi Yang**, Tianwei Lin, Lichao Huang, Elliot J. Crowley, "WidthFormer: Toward Efficient Transformer-based BEV View Transformation", Preprint 2024 (arXiv:2401.03836)
- **Chenhongyi Yang**, Lichao Huang, and Elliot J. Crowley, "Contrastive Object-level Pre-training with Spatial Noise Curriculum Learning", Preprint 2021 (arXiv:2111.13651)