

# CHENHONGYI YANG

School of Engineering, University of Edinburgh, UK

+44 07536957139 | [chenhongyi.yang@ed.ac.uk](mailto:chenhongyi.yang@ed.ac.uk) | Edinburgh, UK

Website: [chenhongyiyang.com](http://chenhongyiyang.com) | Github: [github.com/ChenhongyiYang](https://github.com/ChenhongyiYang)

## EDUCATION

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### University of Edinburgh

02/2021 – Present

- Ph.D. in Engineering, Supervisor: Dr. Elliot J. Crowley
- Research: Currently working on developing efficient visual recognition algorithms.

### Boston University

09/2018 - 06/2020

- M.S. in Computer Science, Supervisor: Prof. Margrit Betke

### University of Science and Technology of China

09/2014 - 06/2018

- B.E. in Computer Science and Technology

## PUBLICATIONS

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- **C. Yang**, M. Ochal, A. Storkey, E. Crowley "Prediction-Guided Distillation for Dense Object Detection", ECCV 2022
- **C. Yang**, Z. Huang, N. Wang "QueryDet: Cascade Sparse Query for Small Object Detection", CVPR 2022 (Oral)
- **C. Yang**, Li, Huang, E. Crowley "Contrastive Object-level Pre-training with Spatial Noise Curriculum Learning", Arxiv 2111.13651
- **C. Yang\***, Z. Chen\*, Q. Li, F. Zhao, Z. Zha, F. Wu "Disentangle Your Dense Object Detector", ACM MM 2021 (Oral)
- K. Wang, **C. Yang**, M. Betke "Consistency Regularization with High-dimensional Non-adversarial Source-guided Perturbation for Unsupervised Domain Adaptation in Segmentation", AAAI 2021
- **C. Yang**, V. Ablavsky, K. Wang, Q. Feng, M. Betke "Learning to Separate: Detecting Heavily-Occluded Objects in Urban Scenes", ECCV 2020

## SELECTED RESEARCH PROJECTS

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### Prediction-Guided Knowledge Distillation of Dense Object Detectors

11/2021 – 03/2022

- We proposed a new knowledge distillation framework for dense object detectors. It distills every object in a few key predictive regions and uses an adaptive weighting scheme for weighting distillation loss in such regions.

### Instance-level Self-supervised Pre-training with Curriculum Learning

03/2021 – 11/2021

- We proposed an instance-level self-supervised pre-training approach. It uses selective search to find rough object regions and trains a model by contrasting the regional features. In addition, we also proposed a curriculum learning mechanism to adaptively raise the magnitude of data augmentation that improves the model's generalisation ability.

### Studies about Disentanglement in Dense Object Detectors

01/2021 – 04/2021

- We investigated the conjunction problem in the state-of-the-art dense object detectors. Based on our findings, we proposed three efficient disentanglement strategies that greatly boost the performance of a wide range of detectors.

### Fast Small Object Detection Using High-resolution Features

04/2020 – 12/2020

- We proposed QueryDet, a framework for fast small object detection when using high-resolution features. QueryDet first predicts the coarse locations of small objects on low-resolution features and then computes the accurate detection results using high-resolution features using a fast sparse convolution operation.

### Detecting Heavily Occluded Objects

06/2019 – 01/2020

- Proposed SG-NMS, a new non-maximum-suppression algorithm to improve detection recall in heavy occlusion scenes. SG-NMS was based on an object level embedding mechanism where occluded objects were separated in the embedding space. We also improved the R-FCN detector by using self-attention to align semantic features and geometric features of each object.

## INDUSTRIAL EXPERIENCE

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### Full-time Research Intern in Computer Vision

05/2020 – 02/2021

**TuSimple** – Supervisor: Dr. Naiyan Wang

- Proposed a new fast small object detection framework QueryDet that was published in CVPR 2022.
- Integrated QueryDet and other recent detection techniques into the SimpleDet detection toolkit.

## SKILLS

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Python, C, C++, Java, HTML/CSS/Javascript, PyTorch, Tensorflow, MXNet, Latex