Xinyu Liu

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Address: City University of Hong Kong, Tat Chee Avenue, Kowloon Tong, Hong Kong SAR

Education

City University of Hong Kong — Hong Kong SAR
Ph.D. in Electrical Engineering — *Sep. 2020 - Present*
Advisor: Dr. Yixuan Yuan

Harbin Institute of Technology — Harbin, China
M.Sc. in Control Science & Engineering — *Sep. 2018 - Jul. 2020*
Thesis: Research on Anchor-free Object Detection and Instance Segmentation Algorithms
Advisor: Dr. Xiaoguang Di

Harbin Institute of Technology — Harbin, China
B.Sc. (Hons.) in Automation — *Sep. 2014 - Jun. 2018*
Thesis: Research on Disparity Map Acquisition Algorithms Based on Binocular Vision

Research Interest

My research interest lies on **Computer Vision and Pattern Recognition**, **Medical image Processing**. I focus on **object detection** and **segmentation** tasks.

Selected Honors & Awards

- Outstanding Thesis Defence Award, Harbin Institute of Technology, PR China, 2020.
- Scholarship for Postgraduates, First-Class, Ministry of Education, PR China, 2018–2020.
- Postgraduate Annual Scholarship, Second-Class, Harbin Institute of Technology, PR China, 2019.
- Honorable Graduate, Honors School, Harbin Institute of Technology, PR China, 2018.
- 2017 International Aerial Robotics Competition, Second-Class, Association for Unmanned Vehicle Systems International, 2017.
- National Grants, Ministry of Education, PR China, 2014-2015.
- People's Scholarship, Third-Class (Twice), Harbin Institute of Technology, PR China, 2014, 2018.

Internship Experience

Deepwise AI Lab — Beijing, China
Machine Learning Intern — *Apr. 2019 - Aug. 2019*
Advisor : Fandong Zhang Prof. Yizhou Yu

- **Topic: Anchor-Free Object Detection, with Data Augmentation and Backbone Enhancement**:
  - Research on improving the precision of object detection in various datasets based on anchor-free methods. Research on data augmentation and backbone enhancement methods for object detection.

Research Experience

Object Detection and Instance Segmentation, Deepwise AI Lab & Harbin Institute of Technology — Beijing & Harbin, China
Machine Learning Intern, Graduate Research Assistant — *Apr. 2019 - Jul. 2020*

- **Topic 1: Anchor-Free Object Detection Methods on Public and Private Datasets** :
  - Propose a novel method of object detection based on anchor-free methods.
- **Topic 2: Anchor-Free Instance Segmentation Methods on Public and Private Datasets**:
  - Propose a novel method of instance segmentation based on anchor-free methods.

Developing A Novel Activation Function For Image Classification, Harbin Institute of Technology — Harbin, China
Graduate Research Assistant — *Aug. 2019 - Sep. 2019*

- **Topic: Research on Smooth and Non-Linear Activation Functions**:
  - Propose TanhExp, which can significantly boost the classification accuracy on lightweight neural networks.

Fully-Supervised Semantic Segmentation Based on CNN and RNN, Harbin Institute of Technology — Harbin, China
Graduate Research Assistant — *Dec. 2018 - Jul. 2019*

- **Topic: Merging Multi-Scale Features Through Recurrent Neural Network**:
  - Improve semantic segmentation accuracy via multi-scale Recurrent neural networks.

Real Time Automatic Welding Spot Quality Inspection, Harbin Institute of Technology — Harbin, China
Graduate Research Assistant — *Jun. 2018 – Dec. 2019*

- **Topic 1: Welding Spot Quality Dataset Establishing**:
  - Develop an automatic labeling tool for welding spot data labeling.
- **Topic 2: A Real-Time Architecture for Segmenting Welding Spots and Assessing their Quality**:
  - Segment spots via a proposed compressed U-net and do post-processing.

International Aerial Robotics Competition, Harbin Institute of Technology — Harbin, China
Undergraduate Research Assistant — *Dec. 2016 - Aug. 2017*

- **Topic: Trajectory Planning and Implementing of Ground Robots**:
  - Realize the trajectory control of the robot based on an Arduino board.

PUBLICATION

Some of the selected research details is available on LINK.

- **Journal Papers**:

  [1] **Xinyu Liu**, Xiaoguang Di, "Global Context Parallel Attention for Anchor-free Instance Segmentation in Remote Sensing Images," *Submitted*, 2020.

  [2] **Xinyu Liu**, Xiaoguang Di, Junde Wu, and Jiehao Huang, "Vector Encoded Bounding Box Regression for Detecting Remote Sensing Objects with Anchor-free Methods," *Submitted*, 2020.

  [3] **Xinyu Liu**, Xiaoguang Di, "TanhExp: A Smooth Activation Function with High Convergence Speed for Lightweight Neural Networks," *arXiv 2003.09855*, 2020.

  [4] Haoxin Zhang, Xiaoguang Di, **Xinyu Liu**, "Merging Multi-Scale Features through Recurrent Neural Network for Semantic Segmentation," *Submitted*, 2019.

IN-SCHOOL POSITIONS

* Vice-minister of The Department of Propaganda, Student Union
* Teaching Assistant for Undergraduates
* Commissary in Charge of Science and Technology

TECHNICAL & PROGRAMMING SKILLS

* Programming: Python (Pytorch, Tensorflow, Numpy), C++, MATLAB, Arduino, HTML5, LaTeX
* Tools: Git, Jupyter Notebook, Robot Operating System (ROS)

ENGLISH PROFICIENCY

* **IELTS**, *Score*: **7.0** (Listening: 7.5 Reading: 8.0 Writing: 6.5 Speaking: 6.0)

REFERENCES AVAILABLE TO CONTACT

* **Dr. Yixuan Yuan**, Assistant Professor, City University of Hong Kong, Hong Kong SAR. ✉: yxyuan.ee@cityu.edu.hk
* **Dr. Xiaoguang Di**, Associate Professor, Harbin Institute of Technology, Harbin, China. ✉: dixiaoguang@hit.edu.cn