Zhuoran **Yu**

PH.D RESEARCHER · UW-MADISON

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Computer Vision · Deep Learning · Label-Efficient Learning

Education

University of Wisconsin-Madison — *Madison, WI*

PH.D IN COMPUTER SCIENCE — *Sep 2021 - Present*

- Advisor: Yong Jae Lee

Georgia Institute of Technology — *Atlanta, GA*

MASTER OF SCIENCE IN COMPUTER SCIENCE — *Aug 2018 - Aug 2020*

- GPA: 4.0/4.0

University of Waterloo — *Waterloo, Canada*

B.MATH IN COMPUTER SCIENCE AND APPLIED MATH(DOUBLE MAJOR) — *Jan. 2014 - June 2018*

- Graduate With Distinction & Dean's Honor List
- Arthur Beaumont Memorial Scholarship

Research Interests

Learning with Minimal Supervision {semi, self, }-supervised learning for fundamental computer vision tasks

Efficient Deep Learning Improving architecture design and training recipes for on-device models

Multi-modality learning Learning by combining images with other modalities such as text and audio

Publication

Diversify, Don't Fine-Tune: Scaling Up Visual Recognition Training with Synthetic Images

ZHUORAN YU, CHENCHEN ZHU, SEAN CULATANA, RAGHURAMAN KRISHNAMOORTHI, FANYI XIAO* YONG JAE LEE*

(* EQUAL ADVISING)

CVPR 2024, Under Review

Crafting the Contrast: Improved Zero-shot Image Classification via Pairwise Attribute Contrasting

ZHUORAN YU, YONG JAE LEE

CVPR 2024, Under Review

Denoising and Selecting Pseudo-Heatmaps for Semi-Supervised Human Pose Estimation

ZHUORAN YU*, MANCHEN WANG*, YANBEI CHEN, PAOLO FAVARO, DAVIDE MODOLO (* EQUAL CONTRIBUTION)

Winter Conference on Applications of Computer Vision (WACV), Waikoloa, Hawaii, 2024

InPL: Pseudo-labeling the Inliers First for Imbalanced Semi-supervised Learning

ZHUORAN YU, YIN LI, YONG JAE LEE

International Conference on Learning Representations (**ICLR**) , Kigali Rwanda, 2023

Group R-CNN for Weakly Semi-supervised Object Detection with Points

SHILONG ZHANG*, **ZHUORAN YU***, LIYANG LIU*, XINJIANG WANG, AOJUN ZHOU, KAI CHEN (* EQUAL CONTRIBUTION)

Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), New Orleans, 2022

Scale-Equalizing Pyramid Convolution for Object Detection

XINJIANG WANG*, SHILONG ZHANG*, **ZHUORAN YU**, LITONG FENG, WEI ZHANG (* EQUAL CONTRIBUTION)

Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), Virtual, 2020

Past Projects

[1] Semi-Supervised Learning for 2D Human Pose Estimation
AWS AI Rekognition

Internship Research — *May. 2022 - Aug. 2022*

- Proposed two key mechanism for heatmap-based human pose estimators under SSL scenario: Pseudo-label Augment and Cross-model Label Selection
- Pseudo-Label Augment: combining weak and strong augmentations through affine transformations in pseudo-label generation stage
- Cross-model Label Selection: using uncertainty estimation to select pseudo-labels from multiple students for better quality of pseudo-labels

[2] Semi-Supervised Object Detection
Georgia Tech

Master Research — *Aug. 2020 - May. 2020*

- Proposed a novel consistency-based approach that enforces consistency between different scales of features
- Combined soft and hard pseudo-labels to densify gradients
- Advanced the performance of Faster R-CNN with 1% labeled data by 3 mAP over prior-arts

[3]Making Neural Networks Executable at Multiple Resolutions
SenseTime Research

Internship Research — *May 2019 - Nov 2019*

- Propose a multi-resolution training strategy to tackle the accuracy drop from training-testing resolution discrepancy
- Propose scale-specific BN to deal with the running statistics discrepancy between different resolutions

[4]SenseKitchen: A Real-World Object Detection System for Food Safety Guards
SenseTime Research

Industry Research — *July 2019 - Dec 2019*

- Analyze computation overheads of object detectors and reduce the parameters of computation-intensive parts
- Achieve 1% higher recall with 5x faster inference speed over previously released models

Experience

Meta, CORE AI team
Menlo Park, CA

Research Scientist Intern — *May 2023 - Aug 2023*

- Improving recognition model with synthetic data from pre-trained diffusion models
- Generating diversified synthetic imaes by diversifying prompts with large language models
- Achieving 1-2% accuracy improvement for in-domain evaluation and more than 10% improvement for out-of-domain evaluation with large transformer architectures
- Submitted to CVPR 2024

AWS AI Rekognition
Seattle, WA

Applied Scientist Intern — *May 2022 - Aug 2022*

- Semi-supervised learning for 2D human pose estimation
- Proposed Pseudo-label Augment and Cross-model Pseudo-label selection: achieved 4+% absolute AP improvement over prior art with 1K labeled human instances
- Paper accepted by WACV 2024

Georgia Tech
Atlanta, GA

Graduate Research, Mentor: Zsolt Kira — *Aug 2020 - July 2021*

- Semi-Supervised Object Detection: a multi-scale consistency approach
- Self-Supervised Learning aids RL agent(starcraft environment)

Research Intern
Shenzhen, China

SenseTime Research, Mentor: Xinjiang Wang and Kai Chen — *May 2019 - Dec. 2019*

- Efficient Deep Learning to reduce the latency of deep neural networks
- Object Detection on both industrial production and academic research

Skills

Languages Python, Java, C/C++, Matlab

Frameworks Pytorch, TensorFlow, Numpy, Pandas, Scikit-Learn

Teaching Assistantship

University of Wisconsin-Madison

Fall 2021 **CS 354 Machine Organization and Programming** *Madison, WI*

Georgia Institute of Technology

Spring 2020-2021 **CS 7643 Deep Learning** *Atlanta, GA*

Spring 2019 **CS 7641 Machine Learning** *Atlanta, GA*

Honors & Awards

University of Wisconsin-Madison

2021 **First-Year Graduate Scholarship** *Madison, WI*

University of Waterloo

2018 **Arthur Beaumont Memorial Scholarship** *Waterloo, Canada*

2014-18 **Dean's Honor List** multiple times *Waterloo, Canada*