Yang Zou

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Research Interests

Deep learning, computer vision,weakly/semi/self-supervised learning, scene understanding.

Education

Carnegie Mellon University — Pittsburgh, PA
Ph.D. Electrical and Computer Engineering (GPA: 3.93/4.00) — 09/2016 – 09/2020
Thesis: Weakly Supervised Visual Understanding
Committee: Vijayakumar Bhagavatula (Advisor), Aswin Sankaranarayanan, Zhiding Yu (NVIDIA),
Rama Chellappa (Johns Hopkins Univ.)

Chongqing University — Chongqing, China
Master in Automation — 09/2012 – 06/2015
Bachelor in Mathematics — 09/2007 – 06/2011

Work Experience

Amazon Web Services — Seattle, WA
Applied Scientist II, Amazon Rekognition — 11/2020 – Present

NVIDIA Research — Santa Clara, CA
Research Intern, Perception Research Group (Mentors: Xiaodong Yang, Zhiding Yu) — 05/2019 - 12/2019
- Intern Project: Joint disentangling and adaptation for cross-domain person re-identification
- Proposed DG-Net++ with state-of-the-art performance on Market $\leftrightarrow$ Duke, MSMT $\leftrightarrow$ Market, MSMT $\leftrightarrow$ Duke
- One paper [2] was published in ECCV 2020 with an oral presentation.

General Motors Research & **Development** — Warren, MI
Research Intern, Perception Group (Mentors: Jinsong Wang, Priyantha Mudalige) — 06/2018 - 08/2018
- Intern Project: Deep CNN based domain adaptation for semantic segmentation
- Winner of 3rd place, domain adaptation for semantic segmentation subtrack, WAD Challenge, CVPR 2018
- 49.8% mAP on GTA5 $\rightarrow$ Cityscapes and 50.1% mAP on SYNTHIA $\rightarrow$ Cityscapes
- One paper [3] was published in ICCV 2019 with an oral presentation.

Selected Publications (Full Publication List in Google Scholar)

[1] Zeyi Huang*, **Yang Zou***, Vijayakumar Bhagavatula, Dong Huang, *Comprehensive Attention Self-Distillation for Weakly-Supervised Object Detection*, **NeurIPS**, 2020 (* indicates equal contribution) [**code**]

[2] **Yang Zou**, Xiaodong Yang, Zhiding Yu, Vijayakumar Bhagavatula, Jan Kautz, *Joint Disentangling and Adaptation for Cross Domain Person Re-Identification*, **ECCV**, 2020 **(Oral)**

[3] **Yang Zou**, Zhiding Yu, Xiaofeng Liu, Vijayakumar Bhagavatula, Jinsong Wang, *Confidence Regularized Self-Training*, **ICCV**, 2019 **(Oral)** [**code**]

[4] Xiaofeng Liu*, **Yang Zou***, Tong Che, Wanqing Xie, Ping Jia, Jane You, Vijayakumar Bhagavatula, *Conservative Wasserstein Training for Pose Estimation*, **ICCV**, 2019 (* indicates equal contribution)

[5] **Yang Zou**, Zhiding Yu, Vijayakumar Bhagavatula, Jinsong Wang, *Unsupervised Domain Adaptation for Semantic Segmentation via Class-Balanced Self-Training*, **ECCV**, 2018 (**Winning method of 1st & 3rd places at WAD18 Challenge**) [**code**][**challenge**]

[6] Zhiding Yu, Weiyang Liu, **Yang Zou**, Chen Feng, Srikumar Ramalingam, Vijayakumar Bhagavatula, Jan Kautz, *Simultaneous Edge Alignment and Learning*, **ECCV**, 2018

[7] Soheil Kolouri, **Yang Zou**, Gustavo Rohde, *Sliced Wasserstein Kernels for Probability Distributions*, **CVPR**, 2016

Selected Honors & Awards

3rd place, Domain adaptation for semantic segmentation subtrack, WAD Challenge, CVPR — 2018
Carnegie Institute of Technology Dean's Tuition Fellowship, CMU — 2016

US Patents

Yang Zou, Zhiding Yu, Vijayakumar Bhagavatula, Jinsong Wang, *Class-balanced Self-Training with Spatial Priors*, — US15/949,519

Academic Services

Conference Reviewer/Program committee: NeurIPS'20, ICML'21, CVPR'20/21, ECCV'20, ICCV'19/21, TPAMI, etc
Journal Reviewer: IEEE Transaction on Image Processing/Neural Networks and Learning Systems

Skills

Programming: Python, MATLAB, C++
Deep Learning: Pytorch, MXNet, TensorFlow, Caffe

Selected Projects

Learning Cross-Domain Adaptation for Visual Scene Understanding CMU/NVIDIA/GM, Aug. 2017 - Sep. 2020

- The purpose of this project is to target improved model **robustness and generalization** ability across different domains, under both open set and closed set scenarios. The problem is important since many products require models to work robustly in the wild.
- Designed a series of self-training/pseudo-label/teacher-student based **unsupervised adaptation** methods with state-of-the-art performance on various applications, e.g. semantic segmentation, image classification, person re-ID.
- Developed a joint disentangling and adaptation method for **person style-transfer and cross-domain person re-ID**.
- Proposed **weakly/self-supervised adaptation** method for semantic segmentation with auxiliary task such as depth estimation.
- Won the 3rd place in **Domain adaptation for semantic segmentation subtrack, WAD Challenge, CVPR (Challenge)**.
- Publications and ongoing submissions at major AI conferences with filed patents, including:
    - *Class-Balanced Self-Training* [5], **ECCV'18** (**Paper**, **Project**)
    - *Confidence-Regularized Self-Training* [3], **ICCV'19**, **oral** (**Paper**, **Project**)
    - *Joint Disentangling and Adaptation for Cross-Domain Person re-ID* [2], **ECCV'20, oral** (**Paper**, **Project**)

Weakly-supervised Visual Scene Understanding CMU, June 2018 - Sep. 2020

- This project aims to develop **weakly-supervised learning** frameworks by leveraging various forms of inaccurate supervision, inexact supervision, self-supervision, multi-task constraints.
- Developed a **robust supervised viewpoint estimation** approach under noisy annotations, with state-of-the-art performance on standard benchmarks of orientation estimation for object/vehicle/head/pedestrian.
- Proposed a **weakly-supervised object detection** framework that only takes image-level object category labels during training, with current state-of-the-art WSOD performance on VOC07/12 and MS COCO.
- Publications and ongoing submissions at major AI conferences, including:
    - *Comprehensive Attention Self-Distillation for Weakly-Supervised Object Detection* [1], **NeurIPS'20** (**Project**)
    - *Conservative Wasserstein Training for Pose Estimation* [2], **ICCV'19**, **Paper**

Talks

Joint Disentangling and Adaptation for Cross Domain Person Re-Identification	ECCV, Glasgow, United Kingdom, Aug. 2020
Learning Cross Domain Adaptation for Visual Understanding	Amazon AI/Facebook AI/Visual Informatics @ UT-Austin, 2020
Confidence Regularized Self-Training	ICCV, Seoul, Korea, Oct. 2019
Self Training for Unsupervised Domain Adaptation	Seminar @ Centre for Artificial Intelligence, UTS, Australia, Dec. 2019

Mentored Students

Zeyi Huang (Research Associate CMU)	2019 Fall - 2020 Summer
Oluwafemi Azeez (MS CMU)	Spring 2019

Courses & Teaching

Ph.D. Courses Taken:

10-807 Deep Learning	16-720 Computer Vision
10-701 Machine Learning	10-708 Probabilistic Graphical Models
10-725 Convex Optimization	18-496 Biomedical Imaging and Image Analysis
42-640 Computational Bio-Modeling and Visualization	

Teaching Assistant:

18-202 Math Foundations for Electrical Engineering (Lead TA, Spring 2019)

18-795 Bioimage Informatics (Spring 2016)