

Zhenyu Wu

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EDUCATION

Texas A&M University, College Station, Texas 08/2017-08/2021
Doctor of Philosophy in Computer Science, Advised by Prof. *Zhangyang (Atlas) Wang*

The Ohio State University, Columbus, Ohio 08/2015-05/2017
Master of Science in Computer Science, Advised by Prof. *Han-Wei Shen*

Shanghai Jiao Tong University, Shanghai, China 09/2011-06/2015
Bachelor of Engineering in Information Security, Advised by Prof. *Cunqing Hua*

PUBLICATION

- [C1] D. Hoang, X. Gong, S. Lin, H. Tang, S. Ray, **Z. Wu**, T. Hammond, Z. Wang, L. Han, and W. Fan, “3M-Pose: Multi-output, multi-resolution and multi-path neural architecture search for bottom-up pose prediction”, **ICCV**, 2021, under review.
- [C2] **Z. Wu**, Z. Ren, Y. Wu, Z. Wang, and G. Hua, “TxVAD: Improved Video Action Detection by Transformers”, **ICCV**, 2021, under review.
- [C3] **Z. Wu***, S. Hoang*, S. Lin, Y. Xie, W. Fan, Y. Lin, and Z. Wang, “3D-Aware Multi-modal Guided Hand Generation for 3D Hand Pose Synthesis”, **ACM-MM**, 2020.
- [C4] **Z. Wu**, K. Suresh, P. Narayanan, H. Xu, H. Kwon, and Z. Wang, “Delving into Robust Object Detection from Unmanned Aerial Vehicles: A Deep Nuisance Disentanglement Approach”, **ICCV**, 2019.
- [C5] P. Uplavikar, **Z. Wu**, and Z. Wang, “All-In-One Underwater Image Enhancement using Domain-Adversarial Learning”, **CVPR UG2+ Workshop**, 2019.
- [C6] **Z. Wu**, Z. Wang, Z. Wang, and H. Jin, “Towards Privacy-Preserving Visual Recognition via Adversarial Training: A Pilot Study”, European Conference on Computer Vision (**ECCV**), 2018.
- [C7] J. Wu, Y. Wang, **Z. Wu**, Z. Wang, A. Veeraraghavan, and Y. Lin, “Deep k-Means: Re-Training and Parameter Sharing with Harder Cluster Assignments for Compressing Deep Convolutions”, **ICML**, 2018.
- [J1] **Z. Wu**, Z. Wang, Y. Yuan, J. Zhang, Z. Wang, and H. Jin, “Black-Box Diagnosis and Calibration on GAN Intra-Mode Collapse: A Pilot Study”, **TOMM**, 2021.
- [J2] **Z. Wu***, H. Wang*, Z. Wang, Z. Wang, and H. Jin, “Privacy-Preserving Deep Action Recognition: An Adversarial Learning Framework and A New Dataset”, **TPAMI**, 2020.

RESEARCH INTERESTS & TECHNICAL SKILLS

Research Interests: Privacy / Fairness in Vision, Object / Action Detection, Adversarial Machine Learning
Platforms/Frameworks: OpenGL, CUDA, OpenCV, Matlab, *TensorFlow*, *PyTorch*

PROFESSIONAL EXPERIENCE

Texas A&M University, College Station, TX

08/2017-Present

Position: Graduate Research Assistant with Dr. Zhangyang Wang

1. *Energy-Efficient Video Text Spotting*

- Developed low power text spotting system on Rasp Pi, aiming to reduce energy consumption while maintaining high performance
- Proposed an LBP and Canny edge-based algorithm to identify the key frames and crop text regions to save energy consumption
- Trained EAST model for detection and CRNN model for recognition on low-resolution images. Used L1 filter, ADMM pruner etc. methods in NNI tool to prune both models by about 75 % parameters. Used static/dynamic/QAT quantization methods in Pytorch to quantize both models
- Compressed multiple two-stage end-to-end text spotting models as baselines
- Designed dynamic inference module to speed up the inference

2. *Privacy-Preserving Visual Recognition via Adversarial Learning*

- Fulfilled the privacy-preserving purpose by applying learnable active degradation on image/video data in smart home setting
- Formulated a three-party game among the utility, the privacy budget and the degradation module
- Proposed novel training strategies, evaluation protocols, and result visualization methods
- Collected a benchmark dataset by annotating privacy-related attributes on existing action recognition dataset

3. *Range Regression for Ordinal Labeling Problems*

- Proposed a new ordinal loss function for ordinal regression problem which consider the ordinal relationships for data
- Derived a proximal gradient optimization method for updating the proposed loss function
- Built the proposed ordinal regression layer via CUDA C++ and implemented it in PyTorch

Wormpex AI Research, Seattle, WA

05/2020-08/2020

Position: Computer Vision Research Intern with Dr. Zhou Ren, Dr. Yi Wu and Dr. Gang Hua

End-to-End Video Action Detection with Transformers

- Proposed a Transformer-based Paradigm to do action detection in end-to-end way
- Applied efficient Transformer solutions for training and inference

Tencent AI Lab, Palo Alto, CA

05/2019-08/2019

Position: Computer Vision Research Intern with Dr. Shih-Yao Lin, Dr. Yusheng Xie and Dr. Wei Fan

Hand Synthesis from Pose and Style: a Data Augmentation Approach for 3D Hand Pose Estimation

- Defined the problem of synthesizing hand from pose and style
- Collected the first hand dataset addressing diversity by including volunteers from difference races
- Proposed an style transfer approach using generative models to synthesize hands from conditioned pose and style

Adobe Research, San Jose, CA

01/2019-04/2019

Position: Deep Learning Research Intern with Dr. Zhaowen Wang, Dr. Jianming Zhang and Dr. Hailin Jin

Visual Privacy Shredder: a Machine Unlearning Approach for Privacy Protection in Generative Models

- Defined the problem of unlearning on generative models
- Investigated the memorization issue of generative models on training data
- Proposed an unlearning approach to protect the data violating privacy or copyright

Army Research Lab West, Los Angeles, CA

05/2018-08/2018

Position: Computer Vision Research Intern with Dr. Heesung Kwon

Object Detection in Low-Quality Drone Imagery

- Formulated an adversarial learning pipeline to improve the drone-based detection performance

- Utilizing the free attributes of flying altitude, viewing angle and weather condition to learn nuisance disentangled features

Siemens PLM Software, Cincinnati, OH

05/2016-08/2016

Position: Research Assistant with Dr. Pengcheng Liu

Visual Recognition using Deep Learning

- Built a 5-layer-ConvNet to classify images generated from CAD software using TensorFlow
- Leveraged LSTM+CNN architecture to localize multiple objects of interest in one image
- Collected a data set for classification and localization tasks using NX

Shanghai Jiao Tong University, Shanghai, China

01/2015-06/2015

Position: Graduate Research Assistant with Dr. Cunqin Hua

Wireless LAN Rogue AP Detection System Prototype

- Developed a prototype that can identify naïve Rogue APs
- The server was developed by Web.py framework and the client was running on Android device

Siemens PLM Software, Shanghai, China

07/2014-02/2015

Position: Research Assistant with CTO: Dr. George Allen

1. Modeling with Curved Triangles

- Worked on a curved triangle algorithm to give better results in graphical display
- Derived the Curved Triangle as a triangular Bezier patch from a flat triangle with 3 normals to 3 points
- Implemented the curved triangles using NXOpen libraries, and tested on different geometric models
- Possible Application includes refining tessellation for display, 3D printing and faster model transmission

2. Code Editor by Roslyn (Microsoft Open Compiler Technologies)

- Improved the code editor component in NX (CAD software) using Roslyn Code Analysis technology
- Implemented an editor prototype supporting Indenting, Syntax Highlighting, Code Completion, Intellisense and Verbosity Cleaning
- Developed the editor as a Windows Forms application supporting both Visual Basic and C# features

TEACHING EXPERIENCE

Texas A&M University, College Station, TX

08/2019-05/2020

Position: Graduate Teaching Assistant

- Instructor of CSCE 421: Machine Learning
- Prepared some course materials and served in some lectures

The Ohio State University, Columbus, OH

08/2016-12/2016

Position: Graduate Teaching Assistant

- Instructor of CSE 1223: Introduction to Programming in Java
- Prepared all the course materials and served in all the lectures

ACTIVITIES & AWARDS

Challenge Awards

- CVPR 2020 Low-Power Computer Vision Challenge: Video Track
- Sponsor: Google, Facebook, MediaTek, and Xilinx
- Role: The team leader and main contributor
- Award: **2nd Place out of 11 Teams**

Reviewers

- CVPR, ECCV, ICML, AAI, WACV, ICIP
- TIP, TCSVT