DANDAN SHAN

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EDUCATION

University of Michigan - Ann Arbor, MI, USA *Aug 2020 - Present*
Ph.D. student, Computer Science and Engineering

University of Michigan - Ann Arbor, MI, USA *Aug 2018 - May 2020*
M.Eng., Electrical and Computer Engineering

Soochow University, Jiangsu, China *Sep 2014 - Jun 2018*
B. Eng., Software Engineering

PUBLICATION

COHESIV: Contrastive Object and Hand Embedding Segmentation In Video
Dandan Shan*, Richard E.L. Higgins*, David F. Fouhey. NeurIPS 2021 (acceptance rate=26%).

Understanding Human Hands in Contact at Internet Scale
Dandan Shan, Jiaqi Geng*, Michelle Shu*, David F. Fouhey. CVPR 2020 (Oral, acceptance rate=5.7%).

RESEARCH EXPERIENCE

COHESIV: Contrastive Object and Hand Embedding Segmentation In Video Oct 2020 -
NeurIPS 2021
Graduate Student Research Assistant, CSE, University of Michigan *Advisor: David Fouhey*

- Designed the method to generate "responsibility" maps as pseudo-labels on 3 large video datasets
- Designed and Implemented COHESIV model architecture to predict hand and held object masks
- Trained COHESIV models and conducted evaluation

Understanding Human Hands in Contact at Internet Scale Jan 2019 - June 2020
CVPR 2020 (Oral)
Graduate Student Research Assistant, CSE, University of Michigan *Advisor: David Fouhey*

- Built a large-scale YouTube video dataset (100 Days of Hands) of hands in contact with objects with learning systems consisting of 131 days of footage
- Trained a multi-task hand-object detector with custom data and did final evaluation
- Built a intelligent hand system that integrates full hand state prediction, a pre-trained MANO-based 3D hand mesh reconstruction model and a mesh quality classifier together
- Implemented the model to predict hand future location at pixel-level with Dilated ResNet
- Built the model to predict the hand grasp with only a shown object

Gaze Estimation Feb 2016 - Sep 2016
(Independent) Academic Innovation Research Project, Soochow University *Advisor: Yong Sun*

- Designed a gaze estimator by applying an uncontrained face detector and eye detector, refining eye region with template matching and using Sobel operator to locate pupil
- Improved accuracy by applying "libfacedetection" library to calculate the inclined angle of the face

Biometrics Program Jul 2016
National University of Singapore

· Implemented PCA and LDA feature extractors from scratch, built PCA-based and LDA-based identifiers and evaluated the identifiers using Confusion Matrix
· Implemented face recognition with PCA and LDA respectively

WORK EXPERIENCE

CalmCar Vision System Co., Suzhou, China Aug 2017 - May 2018
System Development Intern *Mentor: Shiqing Cheng*

· Developed a real-time traffic lights state recognition system based on mono camera using neural networks for the **A**dvanced **D**river **A**ssistance **S**ystem which already used in practice in a Level-4 (High Automation) ADAS in cooperation with SAIC Motor Co. Ltd.
· Implemented functions of CAN-file parser for Offline Calmcar Control Center

TEACHING EXPERIENCE

AI4ALL Summer Program, University of Michigan Jul 2020, 2021
Project Instructor

· Designed teaching materials about basic image processing methods, like threading and filtering, and guided high school students to do the detection project
· Designed virtual background vision project to use a people segmentation model to separate foreground/background and do background effects on images/live stream, and guided high school students to do virtual background project

PROJECT EXPERIENCE

3D Motion Capture with the Built-in Camera Computer Vision Course Project

· Collaborated to re-implemented VNet to do 3D pose estimation with a RGB camera
· Assisted with render stereo skeleton using Unity3D

Parkinson's Disease Classification using Neural Networks AI Application Course Project

· Prepared neat brain MRI data via brain extraction and brain calibration
· Built classifier on concatenated Inception-v3 feature of 2 layers from brain MRI which outperforms 3D-CNN model

SERVICE AND VOLUNTARY

Organizer, AI seminar, University of Michigan	Aug 2021 - May 2022
Coordinator, Computer Vision Reading Group, University of Michigan	Aug 2020 - May 2021
Webmaster, Ensemble of CSE Ladies, University of Michigan	Aug 2020 - Present
Mentor, Ensemble of CSE Ladies, University of Michigan	Sep 2019 - Dec 2019
Web designer and maintainer, Vision@UMich offical webpage	Sep 2019 - Present
Volunteer, AI Symposium at the University of Michigan	Oct 2019
Web maintainer, TEDxSuzhou official webpage	Sep 2016 - Jan 2017
Social Investigation on Children's Education Status in Ningxia Hui Autonomous Region	Jul 2015

SKILLS

Skilled in using C, C++, Java, Python, Pytorch, Tensorflow
Skilled in Image Processing, Computer Vision, Machine Learning, Web Design

HONORS AND SCHOLARSHIP

Outstanding graduate of Soochow University	Jun 2018
Excellent Thesis of Soochow University	Jun 2018
Grand Prize Excellent Student Scholarship	Oct 2017
Merit Student of Soochow University	Oct 2017
Innovation Award of Soochow University	Oct 2017
Overseas Exchange Scholarship of Soochow University	2016, 2017
Special Award for Social Work of Soochow University	2015, 2016, 2017
Comprehensive Performance Awards of Soochow University	2015, 2016, 2017
1st Prize in National English Competition for College Students	May 2017
1st Prize of Excellent Student Scholarship	2015, 2016
Jiangsu Provincial Government Scholarship	Sep 2016
1st Prize in "Creation is unlimited" Social Practice Competition of Soochow University	May 2015