WEIJIAN DENG

Email: weijian.deng@anu.edu.au ◇ http://weijiandeng.xyz ◇ Google Scholar
Research Fellow ◇ Australian National University

RESEARCH INTERESTS

Machine Learning Safety: Concentrated on the safety of large language models and multimodal modelsh. Empasis on developing robust models for varied environments and creating monitoring mechanisms to detect misuse and analyze failure patterns.

3D Content Modeling & Generation: Focused on the advancement of 3D modeling and generation, specifically for refractive objects. By applying optical principles, aims to significantly enhance the realism and accuracy of 3D objects and scenes.

EDUCATION

Australian National University, Australia *Jul 2019 - Jan 2023*
Research Topic: Predicting Modeling Generalization
Supervisors: Prof. Stephen Gould, Dr. Yumin Suh, Dr. Liang Zheng

University of Chinese Academy of Sciences, China *Sep 2016 - Jun 2019*
Master of Science in Computer Science
Research Topic: Object Recognition
Supervisor: Prof. Jianbin Jiao

Beijing Jiaotong University, China *Sep 2012 - Jun 2016*
Bachelor of Engineering

EXPERIENCE

Research Fellow *Jan 2023 - Now*
Australian National University, Australia
Advisor: Prof. Stephen Gould

HEX International Singapore *Jan 2024*
Youth Business Entrepreneurship Programs

Lecturer at SDUW *Nov - Dec 2023*
Joint ANU-SDUW Program, Winter Semester
Introduction to Computer Science, 24 *lectures*

NEC Laboratories America, INC. *Jun 2020 - Sep 2020*
Research Intern (Remote) on Multi-task Learning
Hosted by Dr. Yumin Suh

Singapore University of Technology and Design *Aug 2018 - Nov 2018*
Research Assistant on Domain Adaptation
Hosted by Dr. Liang Zheng

PROFESSIONAL SERVICE

Action Editor Transactions on Machine Learning Research
ACM MM 2024 Area Chair
Co-organizer: CVPR'22 Tutorial on Evaluating Models Beyond the Textbook: Out-of-distribution and Without Labels (https://sites.google.com/view/evalmodel)
Co-organizer: ECCV'20 Visual Domain Adaptation Challenge (http://ai.bu.edu/visda-2020)
Conference Reviewer: NeurIPS'22-23; ICML'22-24; ICLR'22-24; ICCV'21,23; CVPR'21-24;

Journal Reviewer: IEEE-TPAMI; IEEE-TIP; IJCV
Guest Lecturer: SUTD Dec 2018 (*Image-Image Translation*); ANU Sep 2019 (*SVDNet*)
Research Talks: *Model Evaluation With Self-Supervision*, SYSU, Jun 2022; *Predicting Model Generalization*, NUS, Jan 2024; *Unsupervised Model Evaluation*, A* Star, Jan 2024

AWARDS & HONORS

NeurIPS 2023 Top Reviewer, 2023
NeurIPS 2022 Scholar Award, 2022
ICML 2022 Top 10% Reviewer, 2022
ECCV 2020 Outstanding Reviewer, 2022
Australian Government Research Training Program (AGRTP) Scholarship, 2019-2023
The Third Place in Vehicle Re-identification track of CVPR 2019 AI-City Challenge, 2019
China National Scholarship (Master), 2018
China National Scholarship (Bachelor), 2014, 2015

PUBLICATIONS

Summary. Published > 16 papers in top computer vision and machine learning venues such as CVPR, ICCV, ICML, NeurIPS, TPAMI, TIP, and TCSVT. Google Scholar Citations = 2,500.

Predicting Model Generalization

[1] Confidence and Dispersity Speak: Characterising Prediction Matrix for Unsupervised Accuracy Estimation
Weijian Deng, Yumin Suh, Liang Zheng, Stephen Gould
International Conference on Machine Learning (**ICML**), 2023

[2] AutoEval: Are Labels Always Necessary for Classifier Accuracy Evaluation?
Weijian Deng and Liang Zheng
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), 2022

[3] Are Labels Always Necessary for Classifier Accuracy Evaluation?
Weijian Deng and Liang Zheng
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2021

[4] What Does Rotation Prediction Tell Us about Classifier Accuracy under Varying Testing Environments?
Weijian Deng, Stephen Gould, and Liang Zheng
International Conference on Machine Learning (**ICML**), 2021

[5] A Bag-of-Prototypes Dataset Representation
Weijie Tu, **Weijian Deng**, Tom Gedeon, Liang Zheng
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2023

Monitoring Model Reliability

[6] On the Strong Correlation Between Model Invariance and Generalization
Weijian Deng, Stephen Gould, and Liang Zheng
Neural Information Processing Systems (**NeurIPS**), 2022

[7] Adaptive Calibrator Ensemble for Model Calibration under Distribution Shift
Yuli Zou*, **Weijian Deng*** (equal contribution), Liang Zheng
IEEE/CVF International Conference on Computer Vision (**ICCV**), 2023

[9] A Closer Look at the Robustness of Contrastive Language-Image Pre-Training (CLIP)
Weijie Tu, **Weijian Deng**, Tom Gedeon,
Neural Information Processing Systems (**NeurIPS**), 2023

[10] An Empirical Study Into What Matters for Calibrating Vision-Language Models
Weijie Tu, **Weijian Deng**, Dylan Campbell, Stephen Gould, Tom Gedeon
Under Review

[12] Ranking Models in Unlabeled New Environments
Xiaoxiao Sun, Yunzhong Hou, **Weijian Deng**, Hongdong Li, Liang Zheng
IEEE/CVF International Conference on Computer Vision (**ICCV**), 2021

3D Modeling & Generation

[13] Ray Deformation Networks for Novel View Synthesis of Refractive Objects
Weijian Deng, Dylan Campbell, Chunyi Sun, Shubham Kanitkar, Matthew Shaffer, Stephen Gould
IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**), 2024

[14] Differentiable Neural Surface Refinement for Transparent Objects
Weijian Deng, Dylan Campbell, Chunyi Sun, Shubham Kanitkar, Matthew Shaffer, Stephen Gould
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2024

[15] 3D-GPT: Procedural 3D Modeling with Large Language Models
Chunyi Sun, Junlin Han, **Weijian Deng**, Xinlong Wang, Zishan Qin, Stephen Gould
Under Review

Enhancing Visual Recognition

[16] Image-Image Domain Adaptation with Preserved Self-Similarity and Domain-Dissimilarity for Person Re-identification
Weijian Deng, Liang Zheng, Qixiang Ye, Guoliang Kang, Yi Yang, and Jianbin Jiao
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2018

[17] Split to Learn: Gradient Split for Multi-Task Human Image Analysis
Weijian Deng, Yumin Suh, Xiang Yu, Masoud Faraki, Liang Zheng, Manmohan Chandraker
IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**), 2023

[18] Fine-grained Classification via Categorical Memory Networks
Weijian Deng, Joshua Marsh, Stephen Gould, and Liang Zheng
IEEE Transactions on Image Processing (**TIP**), 2022

[19] Rethinking Triplet Loss for Domain Adaptation
Weijian Deng, Liang Zheng, Yifan Sun, and Jianbin Jiao
IEEE Transactions on Circuits and Systems for Video Technology (**TCSVT**), 2020

[20] SVDNet for Pedestrian Retrieval
Yifan Sun, Liang Zheng, **Weijian Deng**, Shengjin Wang
IEEE/CVF International Conference on Computer Vision (**ICCV**), 2017

Technical Report

[21] Similarity-preserving Image-Image Domain Adaptation for Person Re-Identification
Weijian Deng, Liang Zheng, Qixiang Ye, Yi Yang, and Jianbin Jiao
arXiv preprint arXiv:1811.10551

[22] Domain alignment with triplets
Weijian Deng, Liang Zheng, and Jianbin Jiao
arXiv preprint arXiv:1812.00893

[23] Vehicle Re-Identification with Location and Time Stamps
Kai Lv, Heming Du, Yunzhong Hou, **Weijian Deng**, Hao Sheng, Jianbin Jiao, and Liang Zheng
CVPR workshop on AI-City, 2019 (Win 3rd place out of 84 participants)