06/10/2023

Wei-Yu (Harvey) Chen

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RESEARCH INTERESTS

Computational Photography, AR/VR, Optics, Computer Vision, and Machine Learning

EDUCATION

Carnegie Mellon University — Pittsburgh, PA

Ph.D. Candidate in Electrical and Computer Engineering — Sep 2018–

Cumulative QPA: **3.91**/4.00

Relevant Courses: Computational Photography, Physics Based Vision, Physics Based Rendering

National Taiwan University — Taiwan

M.S. in Electrical Engineering — Sep 2015– Jan 2017

Cumulative GPA: **4.20**/4.30; Overall ranking: 4/91; Major: **4.30**/4.30

Relevant Courses: Digital Image Synthesis, Advanced Computer Vision

National Taiwan University — Taiwan

B.S. in Electrical Engineering — Sep 2011– Jun 2015

Cumulative GPA: **4.16**/4.30; Overall ranking: 7/205; Major: **4.21**/4.30

Relevant Courses: Deep Learning, Machine Learning, Digital Visual Effects

RESEARCH EXPERIENCE

AI/ML team, Machine Intelligence Intern — Apple

Neural Rendering — May 2022–Aug 2022

- Synthesized novel views given input images captured from multiple viewpoints.
- Directly rendered point cloud as if they are surfaces.

Image Science Laboratory, Ph.D. Candidate — Carnegie Mellon University

Near-eye 3D display — Sep 2018–

- Generated 3D contents containing a dense set of focal planes within a single exposure time.
- Enabled real-time 3D content streaming such as playing Minecraft.
- Provided a large etendue beyond the limit of an SLM.

Imaging behind Scattering Media

- Recovered mega-pixel fluorescent targets behind a chicken breast tissue from speckle patterns.
- Exploited memory effects to recover images from speckle correlation.
- Improved the speckle correlation contrast by self-interference.

Wavefront Sensing

- Recovered wavefront under a coherent laser illumination with an adaptively self-interfered setup.
- Provided an analytical solution with only four measurements and improved the robustness to noise.
- Measured and detected artifacts in a phase mask such as a diffractive Fresnel lens.

Vision and Learning Laboratory, Short-term Visiting Scholar — Virginia Tech

Few-shot Classification — Apr 2018– Jul 2018

- Empirically studied on performance of meta-learning methods in few-shot classification.
- Discovered that a slightly modified baseline achieved competitive performance with state-of-the-art.

Multimedia and Machine Learning Lab, Research Assistant Academia Sinica, Taiwan

Unsupervised Domain Adaptation Feb 2014– Jan 2017

- Alleviated domain difference in machine learning by exploiting cross-domain data correspondences.
- Discovered latent structural information with maximum mean discrepancy.
- Improved adversarial learning to integrate global and class-wise adaptation with pseudo labels.

TEACHING EXPERIENCE

Course Developing Assistant CMU 18786, Deep Learning, Spring 2023

Teaching Assistant CMU 18793, Imaging and Video Processing, Fall 2022 & Summer 2020

PUBLICATIONS

Split-Lohmann Multifocal Displays [site] [paper] [video] SIGGRAPH 2023

Yingsi Qin, **Wei-Yu Chen**, Matthew O'Toole, and Aswin C. Sankaranarayanan

Pointersect: Neural Rendering with Cloud-Ray Intersection [site] [paper] CVPR 2023

Jen-Hao Rick Chang, **Wei-Yu Chen**, Anurag Ranjan, Kwang Moo Yi, and Oncel Tuzel

Enhancing Speckle Statistics for Imaging Inside Scattering Media [paper] [video] Optica 2022

Wei-Yu Chen, Matthew O'Toole, Aswin C. Sankaranarayanan, and Anat Levin

Reference Wave Design for Wavefront Sensing [paper] [video] ICCP 2021

Wei-Yu Chen, Anat Levin, Matthew O'Toole, and Aswin C. Sankaranarayanan

Transfer Neural Trees: Semi-Supervised Heterogeneous Domain Adaptation and Beyond [paper] TIP 2019

Wei-Yu Chen, Tzu-Ming Harry Hsu, Yao-Hung Tsai, Ming-Syan Chen, and Yu-Chiang Frank Wang

A Closer Look at Few-shot Classification [site] [paper] ICLR 2019

Wei-Yu Chen, Yen-Cheng Liu, Zsolt Kira, Yu-Chiang Frank Wang, and Jia-Bin Huang

No More Discrimination: Cross City Adaptation of Road Scene Segmenters [site] [paper] ICCV 2017

Yi-Hsin Chen, **Wei-Yu Chen**, Yu-Ting Chen, Bo-Cheng Tsai, Yu-Chiang Frank Wang, and Min Sun

Enhanced Canonical Correlation Analysis with Local Density for Cross-Domain Visual Classification [paper] ICASSP 2017

Wei-Jen Ko, Jheng-Ying Yu, **Wei-Yu Chen**, and Yu-Chiang Frank Wang

Transfer Neural Trees for Heterogeneous Domain Adaptation [paper] ECCV 2016

Wei-Yu Chen, Tzu-Ming Harry Hsu, Yao-Hung Tsai, and Yu-Chiang Frank Wang

Domain-Constraint Transfer Coding for Imbalanced Unsupervised Domain Adaptation [paper] AAAI 2016

Yao-Hung Hubert Tsai, Cheng-An Hou, **Wei-Yu Chen**, Yi-Ren Yeh and Yu-Chiang Frank Wang

Unsupervised Domain Adaptation with Imbalanced Cross-Domain Data [paper] ICCV 2015

Tzu-Ming Hsu, **Wei-Yu Chen,** Cheng-An Hou, Yao-Hung Tsai, Yi-Ren Yeh, and Yu-Chiang Frank Wang

Connecting the dots without clue: Unsupervised domain adaptation for cross-domain visual classification [paper] ICIP 2015

Wei-Yu Chen, Tzu-Ming Harry Hsu, Cheng-An Hou, Yi-Ren Yeh, and Yu-Chiang Frank Wang

ACADEMIC SERVICES

Reviewer NeurIPS 2022-23, ICCV 2023, CVPR 2021-22, ICCP 2022-23, TIP 2022-23

Meta Reviewer ICCP 2023

SKILLS

Optics

Optical System, Interferometry, Diffractive Optics, Spatial Light Modulator (SLM)

Programming Languages

Python (Professional), MATLAB (Professional), C++ (Intermediate), R (Intermediate)

Toolboxes/ Libraries

Pytorch, Tensorflow, Open3D, OpenCV, Holotorch

Languages

English (Fluent), Mandarin Chinese (Native), Japanese (Intermediate)

AWARDS & HONORS

Scholarship for Study Abroad — Ministry of Education, Taiwan

Awarded to promising students overseas evaluated by experts in the field. — May 2021

Wei Shen and Xuehong Zhang Presidential Fellowship — Carnegie Mellon University

Awarded to outstanding students in the college of Engineering. — Feb 2021

M.S. Thesis Award — IPPR, Taiwan

Awarded from Taiwan's most representative associations for image processing. — Jul 2017

Representative to Receive Undergraduate Diploma — National Taiwan University

Awarded to students in the department with the top 5% GPA over all semesters. — Jun 2015