

Cho-Ying Wu

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RESEARCH INTERESTS

3D Vision, Computation Photography, Depth Sensing, 3D Faces, Diffusion, Generative Model

WORK

Google LLC, Pixel Camera Autofocus Team

July 17 2023-

- Building depth features for auto-focus and defocus estimation

EDUCATION

University of Southern California (USC)

Aug 2018 – May 2023

PhD, Department of Computer Science

Advised by Prof. Ulrich Neumann

National Taiwan University (NTU)

Aug 2015 – Jun 2017

M.S. in *Communication Engineering*

Advised by Prof. Jian-Jiun Ding

Overall GPA : 4.00/4.00 (4.30/4.30), ranked 1st out of total 121 students

Thesis : *Sparse and low-rank model for occluded face recognition and nonconvex optimization*

National Taiwan University (NTU)

Sept 2011 – Jun 2015

B.S. in *Electrical Engineering, double major in Law, group of Judicial Administration*

Passed Bar Exam in Taiwan (10% pass rate) in 2016 and became a certificated attorney

PUBLICATION LIST

- **Cho-Ying Wu**, Quankai Gao, Chin-Cheng Hsu, Te-Lin Wu, Jing-Wen Chen, Ulrich Neumann “InSpaceType: Reconsider Space Type in Indoor Monocular Depth Estimation”, Conference on Robot Learning (CoRL) OOD Workshop, 2023
- **Cho-Ying Wu**, Yiqi Zhong, Junying Wang, Ulrich Neumann “Resolving Better Geometry Structure from Images using Meta-Optimization”, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) AdvML Workshop* 2023.
- **Cho-Ying Wu**, Jialiang Wang, Michael Hall, Ulrich Neumann, Shuochen Su, “Toward Practical Monocular Indoor Depth Estimation”, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)* 2022.
- **Cho-Ying Wu**, Chin-Cheng Hsu, Ulrich Neumann, “Cross-Modal Perceptionist: Can Face Geometry be Gleaned from Voices?”, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)* 2022.
- **Cho-Ying Wu**, Qiangeng Xu, and U. Neumann, “Accurate Facial Geometry Prediction: 3D Facial Alignment, Orientation Estimation, and 3D Face models,” *3D Vision (3DV)* 2021.
- **Cho-Ying Wu** and U. Neumann, “Scene Completeness-Aware Lidar Depth Completion for Driving Scenario,” *International Conference on Acoustics, Speech, & Signal Processing (ICASSP)* 2021.
- **Cho-Ying Wu**, X. Hu, M. Happold, and U. Neumann, “Geometry-Aware Instance Segmentation with Disparity maps,” *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2020 Scalability on Autonomous Driving*.
- Qiangeng Xu, Xudong Sun, **Cho-Ying Wu**, Panqu Wang, Ulrich Neumann, “Grid-GCN for Fast and Scalable Point Cloud Learning” *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)* 2020.

- **Cho-Ying Wu**, Y. Zhong, S. You, and U. Neumann, “Deep RGB-D Canonical Correlation Analysis For Sparse Depth Completion,” *Conference Neural Information Processing Systems, (NeurIPS) 2019*.
- **Cho-Ying Wu** and U. Neumann, “Iterative L0 Smoothing and Edge Enhancing for Building Outline Abstraction,” *IEEE International Conference on Image Processing (ICIP) 2019*.
- **Cho-Ying Wu** and U. Neumann, Efficient Multi-Domain Dictionary Learning with GANs,” *IEEE Global Signal Information Processing (GlobalSIP) 2019*, Oral.
- **Cho-Ying Wu** and J. J. Ding, “Occluded face recognition using low-rank regression with generalized gradient direction,” *Pattern Recognition (PR)*, vol. 80, pp. 256–268, 2018.
- **Cho-Ying Wu** and J. J. Ding, “Occlusion pattern-based dictionary for robust face recognition,” *IEEE International Conference on Multimedia and Expo (ICME)*, 2016.

INTERNSHIPS

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| NVIDIA Toronto AI Lab, Santa Clara, CA | May 23, 2022 – Aug 19, 2022 |
| - Combining NeRF and Instant-NGP with Latent Diffusion Models for inpainting in neural fields | |
| Facebook Reality Labs, Redmond, WA | May 24, 2021 – Aug 13, 2021 |
| - Sim-to-Real Depth estimation with rendering from Habitat simulator | |
| - 3D Depth Sensing for AR/VR use cases. | |
| Amazon Lab126, Bellevue, WA | May 18, 2020 – Aug 21, 2020 |
| - 3D Facial Alignments, Face Orientation Estimation, and 3D Face Reconstruction | |
| - State-of-the-art performance on all these three tasks | |
| Argo AI, Palo Alto, CA | May 20, 2019 - Aug 23, 2019 |
| - Computer vision intern for autonomous driving working on sensor fusion and instance segmentation | |

HONORS AND SCHOLARSHIPS

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| • Second Prize of Young Author Best Thesis Award , Chinese Inst. of EECS | Oct 2017 |
| - Best and most renowned Master thesis award on EECS in Taiwan | |
| • Honorable Mention Award of Master Thesis Award , Inst. of Inf. & Computation Mach. | Feb 2018 |
| - Best Master thesis award on CS in Taiwan | |
| • Facebook PhD student fellowship finalist, AR/VR Human Understanding | Feb 2022 |

ACADEMIC SERVICES

- **Teaching Assistant**
 - Computer Graphics, University of Southern California Fall 19, Fall 20, Fall 21, Fall 22
 - Database Systems, University of Southern California Spring 20, Spring 21, Spring 22
 - Data Structures and Object Oriented Design, University of Southern California Spring 19
 - Differential Equations, Advanced Signal Processing, National Taiwan University Spring and Fall 16
- **Reviewer:** ICLR24, NeurIPS23, AAAI23-24, CVPR22-24, ECCV22-24, ICCV23, ICIP19-24, ICML24, ACCV24

PATENTS

- Geometry-aware instance segmentation in stereo image capture processes, 2021
- NeRF-sweeper: Inpainting NeRF Road Scenes using 2D Diffusion, Pending Patent, NVIDIA