Yu-Lun Liu

☎ +886 917 161 068
✉ yulunliu@cs.nycu.edu.tw
yulunalexliu.github.io

Research Interests

I work on *image/video processing*, *computer vision*, and *computational photography*, particularly on essential problems requiring *machine learning* with insights from *geometry* and *domain-specific knowledge*.

- 3D from multi-view and sensors
- Image and video synthesis and generation
- Low-level vision
- Computational imaging

Work Experience

Feb. 2023 – **Department of Computer Science, National Yang Ming Chiao Tung University**.
Assistant Professor

May 2022 – Oct. 2022 **Meta Reality Labs Research**.
Research Scientist Intern

Jun. 2017 – Feb. 2022 **MediaTek Inc**.
Senior Algorithm Development Engineer

Sep. 2014 – Jun. 2017 **MediaTek Inc**.
Algorithm Development Engineer

Selected Honors and Awards

Aug. 2023 **Google's Research Grant**, *Google University Relations Programs*.

Aug. 2023 **Best Ph.D. Thesis Award**, *The Chinese Image Processing and Pattern Recognition Society (IPPR)*.

Jul. 2023 **Yushan Young Fellow Program**, *Ministry of Education*, Republic of China (Taiwan).

Nov. 2013 **Academic Achievement Award**, *Institute of Electronics*, NCTU.

May. 2013 **Academic Achievement Award**, *Institute of Electronics*, NCTU.

Education

2017–2022 **Ph.D.**, *National Taiwan University*, Taipei, Taiwan.
Department of Computer Science and Information Engineering, CMLAB
Thesis: Restoring and Enhancing Images and Videos by Combining Modeling and Learning
Advisor: Yung-Yu Chuang link

2012–2014 **M.S.**, *National Chiao-Tung University*, Hsinchu, Taiwan.
Institute of Electronics, CommLab
Thesis: Wide-Angle Virtual View Synthesis with Depth-Based Background Modeling
Advisor: Hsueh-Ming Hang link

2008–2012 **B.S.**, *National Chiao-Tung University*, Hsinchu, Taiwan.
Department of Electronics Engineering

Publications (Google Scholar profile)

Journal papers

TPAMI 2021 **Learning to See Through Obstructions with Layered Decomposition**.
Yu-Lun Liu, Wei-Sheng Lai, Ming-Hsuan Yang, Yung-Yu Chuang, and Jia-Bin Huang
IEEE Transactions on Pattern Analysis and Machine Intelligence, 2021 paper project

Conference papers

ICCV 2023 **Learning Continuous Exposure Value Representations for Single-Image HDR Reconstruction**.
Su-Kai Chen, Hung-Lin Yen, Yu-Lun Liu, Min-Hung Chen, Hou-Ning Hu, Wen-Hsiao Peng and Yen-Yu Lin
Proceedings of the IEEE/CVF International Conference on Computer Vision, 2023 project

ICCV 2023 **ImGeoNet: Image-induced Geometry-aware Voxel Representation for Multi-view 3D Object Detection**.
Tao Tu, Shun-Po Chuang, Yu-Lun Liu, Cheng Sun, Ke Zhang, Donna Roy, Cheng-Hao Kuo, Min Sun
Proceedings of the IEEE/CVF International Conference on Computer Vision, 2023 project

CVPR 2023 **Progressively Optimized Local Radiance Fields for Robust View Synthesis**.
Andreas Meuleman, Yu-Lun Liu, Chen Gao, Jia-Bin Huang, Changil Kim, Min H. Kim, Johannes Kopf
Proceedings of IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2023 paper project

CVPR 2023 **Robust Dynamic Radiance Fields**.
Yu-Lun Liu, Chen Gao, Andreas Meuleman, Hung-Yu Tseng, Ayush Saraf, Changil Kim, Yung-Yu Chuang, Johannes Kopf, Jia-Bin Huang
Proceedings of IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2023 paper project

ICLR 2022 **Denoising Likelihood Score Matching for Conditional Score-based Data Generation** .
Chen-Hao Chao, Wei-Fang Sun, Bo-Wun Cheng, Yi-Chen Lo, Chia-Che Chang, Yu-Lun Liu, Yu-Lin Chang, Chia-Ping Chen, and Chun-Yi Lee
International Conference on Learning Representations, 2022 paper

ICCV 2021 **Bridging Unsupervised and Supervised Depth from Focusvia All-in-Focus Supervision**.
Ning-Hsu Wang, Ren Wang, Yu-Lun Liu, Yu-Hao Huang, Yu-Lin Chang, Chia-Ping Chen, and Kevin Jou
Proceedings of IEEE/CVF Conference on Computer Vision, 2021 paper project

ICCV 2021 **Hybrid Neural Fusion for Full-frame Video Stabilization**.
Yu-Lun Liu, Wei-Sheng Lai, Ming-Hsuan Yang, Yung-Yu Chuang, and Jia-Bin Huang
Proceedings of IEEE/CVF Conference on Computer Vision, 2021 paper project

ICPR 2020 **Explorable Tone Mapping Operators**.
Chien-Chuan Su, Ren Wang, Hung-Jin Lin, Yu-Lun Liu, Chia-Ping Chen, Yu-Lin Chang, and Soo-Chang Pei
Proceedings of the 25th International Conference on Pattern Recognition, 2020 paper

ECCV 2020 **Learning Camera-Aware Noise Models**.
Ke-Chi Chang, Ren Wang, Hung-Jin Lin, Yu-Lun Liu, Chia-Ping Chen, Yu-Lin Chang, and Hwann-Tzong Chen
Proceedings of European Conference on Computer Vision, 2020 paper project

CVPR 2020 **Learning to See Through Obstructions**.
Yu-Lun Liu, Wei-Sheng Lai, Ming-Hsuan Yang, Yung-Yu Chuang, and Jia-Bin Huang
Proceedings of IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2020 paper project

CVPR 2020 **Single-Image HDR Reconstruction by Learning to Reverse the Camera Pipeline**.
Yu-Lun Liu*, Wei-Sheng Lai*, Yu-Sheng Chen, Yi-Lung Kao, Ming-Hsuan Yang, Yung-Yu Chuang, and Jia-Bin Huang
Proceedings of IEEE/CVF Conference on Computer Vision and Pattern Recognition, 2020 paper project

AAAI 2020 **Attention-based View Selection Networks for Light-field Disparity Estimation**.
Yu-Ju Tsai, Yu-Lun Liu, Yung-Yu Chuang, and Ming Ouhyoung
Proceedings of AAAI Conference on Artificial Intelligence, 2020 paper

AAAI 2019 **Deep Video Frame Interpolation using Cyclic Frame Generation**.
Yu-Lun Liu, Yi-Tung Liao, Yen-Yu Lin, and Yung-Yu Chuang
Proceedings of AAAI Conference on Artificial Intelligence, 2019 paper project
Oral Presentation

APSIPA 2014 **Background modeling using depth information**.
Yu-Lun Liu and Hsueh-Ming Hang
Signal and Information Processing Association Annual Summit and Conference, 2014

PCS 2013 **Virtual view synthesis using backward depth warping algorithm**.
Du-Hsiu Li, Hsueh-Ming Hang, and Yu-Lun Liu
Picture Coding Symposium, 2013

Preprints

arXiv 2023 **Dual Associated Encoder for Face Restoration**.
Yu-Ju Tsai, Yu-Lun Liu, Lu Qi, Kelvin CK Chan, Ming-Hsuan Yang
arXiv, 2023 paper

arXiv 2023 **Portrait Distortion Correction with Perspective-Aware 3D GANs**.
Zhixiang Wang, Yu-Lun Liu, Jia-Bin Huang, Shin'ichi Satoh, Sizhuo Ma, Guru Krishnan, Jian Wang
arXiv, 2023 paper project

Talks

Invited Talk **Dynamic and Local Radiance Fields for Robust View Synthesis**.
MediaTek Inc., Hsinchu, Taiwan, May. 2023.

Invited Talk **Dynamic and Local Radiance Fields for Robust View Synthesis**.
Institute of Communications Engineering, NTHU, Hsinchu, Taiwan, April. 2023.

Invited Talk **Dynamic and Local Radiance Fields for Robust View Synthesis**.
The 5th Augmented Intelligence and Interaction (AII) Workshop, Taoyuan, Taiwan, March. 2023.

Guest Lecture **What School and the Workplace Didn't Teach Me**.
NYCU, Hsinchu, Taiwan, March. 2023.

Invited Talk **Learning to See the Unseen**.
Taichung Municipal Taichung First Senior High School, Taichung, Taiwan, March. 2023.

Invited Talk **Learning to See the Unseen**.
Research Center for Information Technology Innovation, Academia Sinica, Taipei, Taiwan, January. 2023.

Invited Talk **Learning to See the Unseen**.
Institute of Information Systems and Applications, NTHU, Hsinchu, Taiwan, November. 2022.

Guest Lecture **Recent Progress on Video Restoration**.
CommE7005, NTU, Taipei, Taiwan, Mar. 2022.

Guest Lecture **Rethinking Multimedia and IC Design in the Era of AI**.
CommE7005, NTU, Taipei, Taiwan, Nov. 2021.

Guest Lecture **CV Final Project - Video Frame Interpolation**.
EEE5053, NTU, Taipei, Taiwan, May. 2021.

Guest Lecture **Rethinking Multimedia and IC Design in the Era of AI**.
DEE4592, NCTU, Hsinchu, Taiwan, Mar. 2021.

Invited Talk **Learning to See Through Obstructions**.
2020 CVPR Taiwan Sharing Session, NTU, Taipei, Taiwan, July. 2020.

Invited Talk **Single-Image HDR Reconstruction by Learning to Reverse the Camera Pipeline**.
2020 CVPR Taiwan Sharing Session, NTU, Taipei, Taiwan, July. 2020.

Guest Lecture **CV Final Project - Depth Estimation**.
EEE5053, NTU, Taipei, Taiwan, Jan. 2020.

Invited Talk **Deep Video Frame Interpolation using Cyclic Frame Generation**.
The 3rd Augmented Intelligence and Interaction (AII) Workshop, Taoyuan, Taiwan, July. 2019.

Oral **Deep Video Frame Interpolation using Cyclic Frame Generation**.
AAAI, Honolulu, Hawaii, USA, Jan. 2019.

Guest Lecture **CV Final Project - Depth Estimation**.
EEE5053, NTU, Taipei, Taiwan, Jan. 2019.

Academic Services

Organizer 2020 CVPR Taiwan Sharing Session

Journal Reviewer	IEEE Transactions on Image Processing (**TIP**) ACM Computing Surveys (**CSUR**) Applied Soft Computing Pattern Recognition ACM Transactions on Graphics (**TOG**) Information Fusion IEEE Transactions on Multimedia International Journal of Computer Vision The Journal of Supercomputing Computer Vision and Image Understanding Computers & Graphics Multidimensional Systems and Signal Processing International Journal of Pattern Recognition and Artificial Intelligence
Conference Reviewer	ACM SIGGRAPH (**SIGGRAPH**), 2022, 2023 IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2022, 2023 IEEE Conference on Computer Vision (**ICCV**), 2021, 2023 European Conference on Computer Vision (**ECCV**), 2020, 2022 British Machine Vision Conference (**BMVC**), 2023 Asian Conference on Computer Vision (**ACCV**), 2020, 2022 International Conference on Learning Representations (**ICLR**), 2022, 2023 Conference on Neural Information Processing Systems (**NeurIPS**), 2022, 2023 International Conference on Machine Learning (**ICML**), 2023 AAAI Conference on Artificial Intelligence (**AAAI**), 2021, 2022, 2023 International Joint Conference on Artificial Intelligence (**IJCAI**), 2021, 2022, 2023 ACM International Conference on Multimedia (**MM**), 2018 IEEE International Conference on Multimedia and Expo Workshops (**ICMEW**), 2023
Research Mentor	Research Mentor for interns at MediaTek Inc., 2019, 2020, 2021, 2022.
Professional Societies	IEEE student member AAAI student member TAAI member IPPR member

Teaching Experiences

Spring 2023	**CSIC30107 Video Compression**, *Department of Computer Science, National Yang Ming Chiao Tung University*.
Spring 2013	**Teaching Assistant of DEE1315 Probability and Statistics with Prof. Hsueh-Ming Hang**, *Department of Electronics Engineering, National Chiao Tung University*.

References

Ph.D. Advisor	**Yung-Yu Chuang**, *Professor of Department of Computer Science and Information Engineering*, National Taiwan University. ✉ cyy@csie.ntu.edu.tw ℹ homepage
M.S. Advisor	**Hsueh-Ming Hang**, *Professor of Department of Electronics Engineering*, National Chiao Tung University. ✉ hmhang@mail.nctu.edu.tw ℹ homepage
Director	**Johannes Kopf**, *Director of the Computational Photography Group*, Meta. ✉ johannes.peter.kopf@gmail.com
Director	**Shaw-Min Lei**, *Director of the Multimedia Technology Development Division*, MediaTek Inc. ✉ shawmin.lei@mediatek.com
Manager of Department	**Yu-Lin Chang**, *Manager of the Intelligent Vision Processing Department*, MediaTek Inc. ✉ yulinchang@google.com
Manager of Department	**Chia-Ping Chen**, *Manager of the Intelligent Vision Processing Department*, MediaTek Inc. ✉ chiaping.chen@mediatek.com

Research Mentor **Ming-Hsuan Yang**, *Professor of Electrical Engineering and Computer Science*, University of California at Merced.
✉ mhyang@ucmerced.edu ℹ homepage

Research Mentor **Jia-Bin Huang**, *Associate Professor of Department of Computer Science*, University of Maryland, College Park.
✉ jbhuang@umd.edu ℹ homepage

Research Mentor **Yen-Yu Lin**, *Professor of Department of Computer Science*, National Yang Ming Chiao Tung University.
✉ lin@cs.nctu.edu.tw ℹ homepage

Research Mentor **Wei-Sheng Lai**, *Software Engineer*, Google.
✉ wlai24@ucmerced.edu ℹ homepage

Research Mentor **Changil Kim**, *Research Scientist*, Meta.
✉ changil@csail.mit.edu ℹ homepage

Research Mentor **Hung-Yu Tseng**, *Research Scientist*, Meta.
✉ hytseng0509@gmail.com ℹ homepage

Research Mentor **Chen Gao**, *Research Scientist*, Meta.
✉ gaochen@meta.com ℹ homepage