

Meng-Lin Wu

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<https://menglin-wu.github.io/>

Education

Purdue University

West Lafayette, Indiana

PhD, Computer Science

2019

Advisor: Voicu Popescu

Thesis: Occlusion management in conventional and head-mounted display visualization through the relaxation of the single viewpoint/timepoint constraint

National Taiwan University

Taipei, Taiwan

BS/MS, Physics

2007

Advisor: Yee Hsiung

Thesis: Search for K_L^0 decay to light pseudoscalar sgoldstino at E391a

Research Areas

Computational Photography

- Bokeh
- HDR imaging
- Blurring/deblurring

Computer Graphics

- AR/VR
- 3D photography

Work Experience

Staff Engineer at Qualcomm Technologies, Inc., San Diego, California

2019 – present

- Research and develop novel computational imaging features for mobile photography.
- Mentor graduate students and interns on image restoration, object detection, and semantic image editing.
- Filed patent applications in the areas: i) 3D photography, ii) light field, depth, and HDR sensing, iii) image segmentation and object detection, iv) diffusion models.
- Shipped the first always-sensing mobile camera feature.

Research Intern at Facebook Reality Labs, Redmond, Washington

2018

- Researched ML-based adaptive ray casting and sparse image denoising / reconstruction.

Autonomous Driving Engineering Intern at nuTonomy, Cambridge, Massachusetts

2017

- Simulated sensors and vehicle dynamics.

Software Developer Intern at Google, Montréal, Canada 2016

- Implemented OpenGL ES 3 features and helped SwiftShader (<https://github.com/google/swiftshader>) become open source.

Intern at VMware, Palo Alto, California 2014

- Implemented OpenGL 3 features and helped release OpenGL 3.3 in VMware Workstation 12 and Fusion 8.
- Contributed to the Mesa 3D graphics library (<https://gitlab.freedesktop.org/mesa/mesa>).

Game Planning Specialist at International Games System, Taipei, Taiwan 2009 – 2010

- Developed a physics engine for arcade racing games.

Academic Experience

Computer Graphics and Visualization Lab, Purdue University, West Lafayette, Indiana 2012 – 2019

- Improved AR/VR navigation efficiency with novel multiperspective approach.
- Rendered 3D scenes from multiple disjoint viewpoints to a single image.
- Developed real-time free-viewpoint video system using RGBD streams.

High Energy Physics Group, National Taiwan University, Taipei, Taiwan 2005 – 2007

- Researched rare K meson decays in E391a Collaboration at KEK proton synchrotron, Japan.
- Developed Monte Carlo simulation and performed statistical analysis.

Publications

Consistent and multi-scale scene graph transformer for semantic-guided image outpainting

CA Yang, ML Wu, RA Yeh, YCF Wang

International Conference on Image Processing 2023

Direct handheld burst imaging to simulated defocus

ML Wu, VRK Dayana, H Hwang

International Conference on Image Processing 2022

Scene graph expansion for semantics-guided image outpainting

CA Yang, CY Tan, WC Fan, CF Yang, ML Wu, YCF Wang

Conference on Computer Vision and Pattern Recognition 2022

Robust image outpainting with learnable image margins

CY Tan, CA Yang, SF Chen, ML Wu, YCF Wang

International Conference on Image Processing 2021

Automatic deictic gestures for animated pedagogical agents

SRK Kappagantula, N Adamo-Villani, ML Wu, V Popescu

IEEE Transactions on Learning Technologies, 2019

RGBD temporal resampling for real-time occlusion removal

ML Wu, V Popescu

*SIGGRAPH Symposium on Interactive 3D Graphics and Games 2019***Anchored multiperspective visualization for efficient VR navigation**

ML Wu, V Popescu

*International Conference on Virtual Reality and Augmented Reality (EuroVR) 2018***Efficient VR and AR navigation through multiperspective occlusion management**

ML Wu, V Popescu

*IEEE Transactions on Visualization and Computer Graphics, 2017**(IEEE Virtual Reality Conference 2018 invited oral presentation)***Digital learning activities delivered by eloquent instructor avatars: scaling with problem instance**

S Anasingaraju, ML Wu, N Adamo-Villani, V Popescu, SW Cook, M Nathan, M Alibali

*SIGGRAPH ASIA 2016 Symposium on Education***Multiperspective focus+context visualization**

ML Wu, V Popescu

*IEEE Transactions on Visualization and Computer Graphics, 2016***Animation killed the video star**

V Popescu, N Adamo-Villani, ML Wu, SD Rajasekaran, MW Alibali, M Nathan, SW Cook

*Proceedings of CHI 2014 Workshop on Gesture-based Interaction Design: Communication and Cognition***Study of the $K_L^0 \rightarrow \pi^0 \pi^0 \nu \bar{\nu}$ decay**R Ogata et al., *Physical Review D*, 2011**Search for the decay $K_L^0 \rightarrow 3\gamma$** YC Tung et al., *Physical Review D*, 2011**Experimental study of the decay $K_L^0 \rightarrow \pi^0 \nu \bar{\nu}$** JKA et al., *Physical Review D*, 2010**Search for a light pseudoscalar particle in the decay $K_L^0 \rightarrow \pi^0 \pi^0 X$** YCT et al., *Physical Review Letters*, 2009**Search for X (214) in $K_L^0 \rightarrow \pi^0 \pi^0 X$ ($X \rightarrow \mu^+ \mu^-$) using back-anti counter at the E391a experiment**R Ogata et al., *2009 KAON International Conference***Search for the decay $K_L^0 \rightarrow \pi^0 \nu \bar{\nu}$** JKA et al., *Physical Review Letters*, 2008

Other Works

Towards light weight object detection system

D KC, VRK Dayana, ML Wu, V Cherukuri, H Hwang

arXiv:2210.03861

Image modification techniques

ML Wu, CC Tsai, A Chen

US Patent App. 17/524,681

Systems and methods for generating synthetic depth of field effects

ML Wu, VRK Dayana

US Patent App. 17/481,155

Speed Driver 4: World Fever (2012)

Power Truck (2011)

Speed Rider 2 (2011)

Speed Driver 3: Crash Hour (2010)

Reviewer

IEEE Transactions on Visualization and Computer Graphics

IEEE Visualization Conference

IEEE Virtual Reality Conference

IEEE International Symposium on Mixed and Augmented Reality

IEEE International Conference on Image Processing

IEEE Computer Graphics and Applications

SIGGRAPH

SIGGRAPH Asia

Eurographics

Eurographics Symposium on Rendering

Computer Animation and Virtual Worlds

Awards

Bilsland Dissertation Fellowship, Purdue University Graduate School