

765-337-6128

# Meng-Lin Wu

[m\\_l\\_wu@hotmail.com](mailto:m_l_wu@hotmail.com)

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

## Education

---

<b>Purdue University</b>	<b>Indiana, U.S.A.</b>
MS/PhD, Computer Science (advisor: Voicu Popescu)	2019
<b>National Taiwan University</b>	<b>Taipei, Taiwan</b>
BS/MS Physics	2007

## Professional Experience

---

<b>Qualcomm Technologies, Inc.</b>	<b>San Diego, California, U.S.A.</b>
Staff Engineer	2019 – present
Research and develop machine learning algorithms to improve the image quality of digital photos, such as those captured with mobile phone cameras. Optimize power efficiency for mobile applications. Synthesize training image datasets.	
<b>Facebook Reality Labs</b>	<b>Redmond, Washington, U.S.A.</b>
Research Intern	2018
Researched ML-based i) adaptive ray casting, and ii) sparse image denoising / reconstruction. Implemented the ML models using CNNs and GANs. Analyzed inference complexity.	
<b>nuTonomy</b>	<b>Cambridge, Massachusetts, U.S.A.</b>
Autonomous Driving Engineering Intern	2017
Established real-time validation framework for the autonomous driver by developing i) LiDAR and video sensor simulations to validate perception routine, and ii) vehicle simulation to validate low-level controller. Performed system identification on Renault Zoe and reproduced vehicle dynamics.	
<b>Google</b>	<b>Montréal, Québec, Canada</b>
Software Developer Intern	2016
Assisted in open-sourcing SwiftShader – Implemented OpenGL ES 3 features, leveraging CPU vector instructions for performance.	
<b>VMware</b>	<b>Palo Alto, California, U.S.A.</b>
Intern, Member of Technical Staff	2014
Assisted in releasing VMware Workstation 12 and Fusion 8 with OpenGL 3.3 support – Implemented virtual graphics adapter OpenGL 3.x features.	

## International Games System

Taipei, Taiwan

Game Planning Specialist, Physics Team

2009 – 2010

Developed vehicle simulation engine for racing games – Enabled rapid development of the titles *Speed Driver 3* (2010), *Speed Rider 2* (2011), *Power Truck* (2011), and *Speed Driver 4* (2012).

## Academic Projects

---

### Computer Graphics and Visualization Lab, Purdue University

West Lafayette, Indiana, U.S.A.

#### Occlusion Management in Real World Scenes

Developed real-time free-viewpoint video system leveraging RGBD streams, image and point cloud segmentation, object detection and tracking, and video inpainting. Presented at *ACM I3D 2019*.

#### Multiperspective Visualization for AR / VR Navigation

Improved AR / VR navigation efficiency with novel multiperspective approach. Conducted user studies using Microsoft HoloLens and Windows Mixed Reality headsets. The studies showed our method to be effective and intuitive. Presented at *IEEE VR 2018* and *EuroVR 2018*.

#### Multiperspective Focus+Context Visualization

Designed a flexible camera model to render 3D scenes from multiple disjoint viewpoints to a single image. Developed real-time ray tracing and rasterization algorithms. Published in *IEEE TVCG*.

### High Energy Physics Group, National Taiwan University

Taipei, Taiwan

Analyzed K meson decays in 4 and 6 photon modes in E391a Collaboration at KEK proton synchrotron, Japan. Established upper bounds for branching fractions of rare decay modes. Calibrated beamline model and generated Monte Carlo simulation. Published in *Physical Review Letters*.

## Awards

---

Bilsland Dissertation Fellowship, Purdue University Graduate School

## Publications

---

1. Scene Graph Expansion for Semantics-Guided Image Outpainting. CA Yang, CY Tan, WC Fan, CF Yang, **ML Wu**, YC Frank Wang, *IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2022
2. Robust Image Outpainting With Learnable Image Margins. CY Tan, CA Yang, SF Chen, **ML Wu**, YC Frank Wang, *IEEE International Conference on Image Processing*, 2021
3. Automatic Deictic Gestures for Animated Pedagogical Agents. SRK Kappagantula, N Adamo-Villani, **ML Wu**, V Popescu, *IEEE Transactions on Learning Technologies*, 2019
4. RGBD Temporal Resampling for Real-Time Occlusion Removal. **ML Wu**, V Popescu, *ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games*, 2019
5. Anchored Multiperspective Visualization for Efficient VR Navigation. **ML Wu**, V Popescu, *International Conference on Virtual Reality and Augmented Reality*, 240-259, 2018

6. Efficient VR and AR navigation through multiperspective occlusion management. **ML Wu**, V Popescu, *IEEE transactions on visualization and computer graphics* 24 (12), 3069-3080, 2017
7. 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*, 5, 2016
8. Multiperspective Focus+Context Visualization. **ML Wu**, V Popescu, *IEEE transactions on visualization and computer graphics* 22 (5), 1555-1567, 2016
9. Animation killed the video star. V Popescu, N Adamo-Villani, **ML Wu**, SD Rajasekaran, MW Alibali, M Nathan, SW Cook, *Proceedings of CHI 2104 Workshop on Gesture-based Interaction Design: Communication and Cognition*, 2014
10. Study of the  $K_L^0 \rightarrow \pi^0 \pi^0 \nu \bar{\nu}$  decay. R Ogata et al. *Physical Review D* 84 (5), 052009, 2011
11. Search for the decay  $K_L^0 \rightarrow 3\gamma$ . YC Tung et al. *Physical Review D* 83 (3), 031101, 2011
12. Experimental study of the decay  $K_L^0 \rightarrow \pi^0 \nu \bar{\nu}$ . JKA et al. *Phys. Rev. D* 81 (7), 2010
13. Search for a Light Pseudoscalar Particle in the Decay  $K_L^0 \rightarrow \pi^0 \pi^0 X$ . YCT et al. *Phys. Rev. Lett.* 102 (5), 2009
14. Search for a light pseudoscalar particle in the decay  $K_L^0 \rightarrow \pi^0 \pi^0 X$  at the E391a experiment. YC Tung et al. *PoS*, 040, 2009
15. 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. *PoS*, 014, 2009
16. Search for the Decay  $K_L^0 \rightarrow \pi^0 \nu \bar{\nu}$ . JKA et al. *Phys. Rev. Lett.* 100 (20), 2008

#### Reviewer

IEEE TVCG	ACM SIGGRAPH
IEEE Visualization Conference	ACM SIGGRAPH Asia
IEEE Virtual Reality Conference	Eurographics Conference
IEEE ISMAR	Eurographics Symposium on Rendering
IEEE ICIP	Computer Animation and Virtual Worlds

#### Proficiency

OpenGL, OpenCV, TensorFlow, Unity, Unreal Engine, C++, Python, Graphics, Vision, Machine Learning