Curriculum Vitae

Weiwu Pang

weiwupan@usc.edu
(323) 791-1024

Education

August 2018— Present

Degree: Ph.D in Computer Science
Where: University of Southern California, Los Angeles, CA
GPA: 4.0 of 4.0

August 2014— May 2018

Degree: Bachelor of Science in Computer Science, Electrical Engineering
Where: University of Southern California, Los Angeles, CA
GPA: 3.83 of 4.0

Research

February 2020— Present

Project: Infrastructure-Based Sensing
Where: University of Southern California, Los Angeles, CA
Advisor: Ramesh Govindan
Contributions:

- I worked with PointCloud Library and 3D sensors.
- I implemented 3D pedestrians and vehicles tracker using euclidean-based clustering and Kalman filters.
- I developed algorithms that use ICP, features matching and SLAM to localize and track camera in the 3D space.
- I designed algorithms to determine LiDAR point clouds' transformation by feeding a rough initial guess from GPS.
- I collected real-time data from Ouster LiDARs, ZED cameras and Intel Realsense cameras.
- I worked with CARLA autonomous driving simulator to test and develop algorithms.

September 2018— February 2020

Project: RIM: Offloading Inference to the Edge
Where: University of Southern California, Los Angeles, CA
Advisor: Ramesh Govindan
Contributions:

- I profiled the run-time and memory requirements of various sequence to sequence neural network models on desktop GPUs and mobile GPUs.
- I implemented various neural network workflows into a DAG forms that each neural network component can be decomposed into prepossessing, application and post-processing stage.

August 2018—October 2018

Project: Situational Awareness through AR/VR headset
Where: University of Southern California, Los Angeles, CA
Advisor: Ramesh Govindan
Contributions:

- I worked with Optitrack to obtain accurate pose(translation and rotation) of the headset.
- I developed a 3D application with Unity that renders the situational information in the headset.
- I interfaced the Unity application with MQTT to receive the situational information.

March 2016—May 2018

Project: Droplet Coherent Diffraction Imaging
Where: University of Southern California, Los Angeles, CA
Advisor: Andrey Vilesov
Contributions:

- I processes X-ray diffraction images from neat and doped helium droplets,
- I developed software to determine sizes/shapes of He droplets and performs DCDI phase retrieval for calculation of embedded cluster densities. Based on Tanyag et al, Struct.Dynam. 2, 051102 (2015).
- I collaborated with the data collection experiments at Stanford Linear Accelerator Lab(SLAC) with PSANA program development.

May 2016—May 2018

Project: Power Disaggregation of System-on-Chip(SOC)
Where: University of Southern California, Los Angeles, CA
Advisor: Young Cho
Contributions:

- I implemented a tool for collecting total power with USB datalogger
- I wrote CUDA program to extract power dissipation map
- I developed a framework to track the CUDA assembly code and its execution timing.

Internship

May 2022—May 2023

Position: Software Engineer Intern
Where: Google Inc., Sunnyvale, CA

- I interned in Google NetInfra's congestion control team.
- I analyzed the frequency of hotspots in different layers in Google's network fleet.

- I developed data processing pipeline that extracts the correlation between network hotspots and application performance
- I analyzed the root-causes and characterization of some hotspots.

May 2021— Aug 2021

Position: Software Engineer Intern
Where: Waymo Inc., Mountain View, CA

- I interned in Waymo Perception team and worked on 3D map change detection.
- I compared on-vehicle LiDAR observation with pre-collected 3D map.
- I developed heuristics to detect positive difference(new constructions) and negative difference(removed structures) in the city environment.
- I implemented a highly parallelizable pipeline that takes LiDAR point clouds and detects the differences.

May 2019— April 2020

Position: Software Engineer Intern
Where: Google Inc., Mountain View, CA

- I interned in Google Cloud NetArch Team and worked on cloud projects characterization.
- I analyzed traffic matrices of instances of Google Cloud Platform.
- I used clustering techniques (Hierarchical clustering, K-Means clustering and Spectral clustering) to analyze traffic matrices.
- I detected project mis-configuration based on the analysis of traffic matrices.
- I complemented anomaly detection models by the project characterization.

May 2018— August 2018

Position: Software Engineer Intern
Where: Google Inc., Mountain View, CA

- I interned in Google Fi Bridge Team and established dynamic MTU mechanism in Fi Bridge network.
- I discovered and characterized Linux kernel's behavior under different settings of Path MTU Discovery.
- I collaborated with Google Marconi team to implement Path MTU Discovery protocol in user space network stack.
- I reduced Fi Bridge network's overhead and improved MTU by 10%.

May 2017— August 2017

Position: Software Engineer Intern
Where: Google Inc., Mountain View, CA

- I interned in Global Software Load Balancer Team and worked on GSLB Reliability(GSLB 345) project.
- I designed and implemented a distributed log collector software that digests RPC logs from GSLB servers.
- I hardened the coverage of the existing GSLB Fuzz Test framework from less than 10% to 50%.
- I worked with Google's infrastructures such as Stubby RPC, Chubby Distributed Lock Service, and Colossus File System.

Teaching

Sept 2021— Dec 2021
Position: Teaching Assitant for CSCI 555
Where: University of Southern California

I worked as a TA for CSCI 555 Advanced Operating system.

May 2016— May 2018
Position: Course Producer
Where: University of Southern California

I worked as a course producer(undergraduate teaching assistant) in introductory Computer Science courses(CSCI 103 and CSCI 104) from my second year until I graduated. I led lab sessions, held office hours and graded homework assignments.

Oct 2015— Jan 2018
Position: Math Tutor at USC Tutoring Service
Where: University of Southern California

I worked as a Math tutor at USC Tutoring Service for Math 125 and Math 125.

Publications

- Sean O'Connell, Deepak Verma, Rico Mayro Tanyag, **Pang, Weiwu**, Camila Bacellar, Catherine Saladrigas, Johannes Mahl, Benjamin Toulson, Yoshiaki Kumagai, Peter Walter, Christoph Bostedt, Oliver Gessner, and Andrey Vilesov. "Vortex Lattice in Rotating Prolate ^{4}He Droplets". In: *APS March Meeting Abstracts*. Vol. 2019. APS Meeting Abstracts. Jan. 2019, p. X24.001
- Deepak Verma, Sean M. O. O'Connell, Alexandra J. Feinberg, Swetha Erukala, Rico Mayro P. Tanyag, Charles Bernando, **Pang, Weiwu**, Catherine A. Saladrigas, Benjamin W. Toulson, Mario Borgwardt, Niranjan Shivaram, Ming-Fu Lin, Andre Al Haddad, Wolfgang Jäger, Christoph Bostedt, Peter Walter, Oliver Gessner, and Andrey F. Vilesov. "Shapes of rotating normal fluid ^{3}He versus superfluid ^{4}He droplets in molecular beams". In: *Phys. Rev. B* 102 (1 July 2020), p. 014504. DOI: 10.1103/PhysRevB.102.014504. URL: https://link.aps.org/doi/10.1103/PhysRevB.102.014504

- Sean M. O. O'Connell, Rico Mayro P. Tanyag, Deepak Verma, Charles Bernando, **Pang, Weiwu**, Camila Bacellar, Catherine A. Saladrigas, Johannes Mahl, Benjamin W. Toulson, Yoshiaki Kumagai, Peter Walter, Francesco Ancilotto, Manuel Barranco, Marti Pi, Christoph Bostedt, Oliver Gessner, and Andrey F. Vilesov. "Angular Momentum in Rotating Superfluid Droplets". In: *Phys. Rev. Lett.* 124 (21 May 2020), p. 215301. DOI: 10.1103/PhysRevLett.124.215301. URL: https://link.aps.org/doi/10.1103/PhysRevLett.124.215301

- Alexandra Feinberg, Deepak Verma, Sean O'Connell, Swetha Erukala, Rico Tanyag, **Pang, Weiwu**, Catherine Saladrigas, Benjamin Toulson, Mario Borgwardt, Niranjan Shivaram, Ming-Fu Lin, Andre Al Haddad, Wolfgang Jäeger, Christoph Bostedt, Peter Walter, Oliver Gessner, and Andrey Vilesov. "Cluster Aggregation in Bosonic and Fermionic Helium Nanodroplets". In: *APS March Meeting Abstracts*. Vol. 2021. APS Meeting Abstracts. Jan. 2021, p. C44.009

- Yitao Hu, **Pang, Weiwu**, Xiaochen Liu, Rajrup Ghosh, Bongjun Ko, Wei-Han Lee, and Ramesh Govindan. "Rim: Offloading Inference to the Edge". In: *Proceedings of the International Conference on Internet-of-Things Design and Implementation*. IoTDI '21. Charlottesvle, VA, USA: Association for Computing Machinery, 2021, pp. 80–92. ISBN: 9781450383547. DOI: 10.1145/3450268.3453521. URL: https://doi.org/10.1145/3450268.3453521

- Alexandra J. Feinberg, Deepak Verma, Sean M.O. O'Connell-Lopez, Swetha Erukala, Rico Mayro P. Tanyag, **Weiwu Pang**, Catherine A. Saladrigas, Benjamin W. Toulson, Mario Borgwardt, Niranjan Shivaram, Ming-Fu Lin, Andre Al Haddad, Wolfgang Jäger, Christoph Bostedt, Peter Walter, Oliver Gessner, and Andrey F. Vilesov. "Aggregation of solutes in bosonic versus fermionic quantum fluids". In: *Science Advances* 7.50 (2021), eabk2247. DOI: 10.1126/sciadv.abk2247. eprint: https://www.science.org/doi/pdf/10.1126/sciadv.abk2247. URL: https://www.science.org/doi/abs/10.1126/sciadv.abk2247

- **Weiwu Pang**, Sourav Panda, Jehangir Amjad, Christophe Diot, and Ramesh Govindan. "CloudCluster: Unearthing the Functional Structure of a Cloud Service". In: *19th USENIX Symposium on Networked Systems Design and Implementation (NSDI 22)*. Renton, WA: USENIX Association, Apr. 2022, pp. 1213–1230. ISBN: 978-1-939133-27-4. URL: https://www.usenix.org/conference/nsdi22/presentation/pang

- Rico Mayro P. Tanyag, Camila Bacellar, **Pang,Weiwu**, Charles Bernando, Luis F. Gomez, Curtis F. Jones, Ken R. Ferguson, Justin Kwok, Denis Anielski, Ali Belkacem, Rebecca Boll, John Bozek, Sebastian Carron, Gang Chen, Tjark Delmas, Lars Englert, Sascha W. Epp, Benjamin Erk, Lutz Foucar, Robert Hartmann, Alexander Hexemer, Martin Huth, Stephen R. Leone, Jonathan H. Ma, Stefano Marchesini, Daniel M. Neumark, Billy K. Poon, James Prell, Daniel Rolles, Benedikt Rudek, Artem Rudenko, Martin Seifrid, Michele Swiggers, Joachim Ullrich, Fabian Weise, Petrus Zwart, Christoph Bostedt, Oliver Gessner, and Andrey F. Vilesov. "Sizes of pure and doped helium droplets from single shot x-ray imaging". In: *The Journal of Chemical Physics* 156.4 (2022), p. 041102. DOI: 10.1063/5.0080342. eprint: https://doi.org/10.1063/5.0080342. URL: https://doi.org/10.1063/5.0080342

- **Weiwu Pang**, Chunyu Xia, Branden Leong, Fawad Ahmad, Jeongyeup Paek, and Ramesh Govindan. "UbiPose: Towards Ubiquitous Outdoor AR Pose Tracking Using Aerial Meshes". In: *29th Annual International Conference on Mobile Computing and Networking (ACM MobiCom 23)*. ACM New York, NY, USA, 2023. DOI: 10.1145/3570361.3613263

Technical experience

Hardware

AR/VR Headsets, Stereo Cameras, LiDARs

Software

C/C++, TensorFlow/Keras, Python, LaTeX, MATLAB, PCL Library, ROS, Unity

Honors and awards

- USC Computer Science Award for Outstanding Research (2018)
- USC Undergraduate Research Associates Program (Spring 2016, Summer 2016, Summer 2017, Fall 2017.)
- USC Provost's Undergraduate Research Fellowship (Spring 2017)