DAVID PAZ

drd.pazr@gmail.com ⋄ http://dfpaz.com ⋄ (857) 285-8033

EDUCATION

University of California, San Diego
Computer Engineering, B.S. *June 2018*
Intelligent Systems, Robotics, and Control, M.S. *March 2020*
Computer Science and Engineering, PhD. *August 2023*

Related Courses: Introduction to Autonomous Vehicle Technology, Introduction to Robotics, Computer Vision, Advanced Data Structures, Statistical Learning, Deep Learning, Reinforcement Learning, Sensing and Estimation, Operating Systems, Computer Architecture, and Software Engineering

EXPERIENCE

Bosch Research, USA July 2024-Present
Senior Scientist and Tech Lead *Sunnyvale, CA*

· Project lead in planning for E2E parking and navigation.
· Transferred online map generation models and RL-based planners to engineering business units for production.
· Published research work at various top-tier conferences including IROS, ICRA, IV, and CVPR.

Bosch Research, USA Aug 2023-June 2024
Research Scientist II *Sunnyvale, CA*

· Research scientist in perception and real-time scene understanding for autonomous driving solutions.
· Worked closely with business units to transfer research solutions to production.

Contextual Robotics Institute, UC San Diego Oct 2017 - Aug 2023
Autonomous Vehicle Laboratory Research Scientist and Project Lead *San Diego, CA*

· Developed core autonomy stack for micro-mobility using GEM e6 vehicles.
· Generated probabilistic semantic maps of the UCSD campus to support dynamic trajectory generation and mapless driving.
· Led the 6-month deployment of two autonomous mail-delivery vehicles; quantified software performance for public release
· Collaborated on multi-modal scene understanding and characterization of pedestrian/vehicle behavior. Work supervised by Dr. Henrik I. Christensen.
· Mentored 10+ students across high school to graduate levels in SLAM, sensor calibration, and system integration.
· For more details, please visit avl.ucsd.edu

Qualcomm Nov 2021-Jan 2023
Robotics Research Assistant *San Diego, CA*

· Developed open-source ROS1/ROS2 applications for the Qualcomm RB5, including fiducial marker detection, GTSAM wrappers, and mBot Mega controllers.
· Standardized hardware workflows by defining processes for building and loading custom kernel modules on the RB5 platform.
· Scaled robotics education by prototyping the mBot Mega; successfully deployed 100+ units as the primary learning platform for graduate-level courses at UCSD.
· For more details, please visit https://autonomousvehiclelaboratory.github.io/RB5_Robotics_Tutorials/

TuSimple   June 2021-Sept 2021

Perception Engineer Intern   *San Diego, CA*

· Quantified key performance benefits and constraints of flow data in an online perception system.

· Designed and implemented a context-aware tracking framework for occlusion scenarios.

· Engaged and collaborated with tracking team to develop, verify, and deploy tracker features on a full-scale autonomous truck.

TuSimple   July 2018-May 2019

L4 – Verification Engineer   *San Diego, CA*

· Developed a logging device for bench-marking the performance of Level 4 autonomous trucks. Designed, verified and performed initial testing on UCSD self-driving cars. For additional details on the study, please click here.

Computation Structures Group, MIT CSAIL   June 2017 - Sept 2017

Research Assistant   *Cambridge, MA*

· Developed flexible two-dimensional convolution accelerators ideal for IoT to provide significant performance gains over sequential computations and flexibility over application-specific accelerators such as Convolution Neural Networks–supervised by Dr. Arvind.

San Diego Supercomputer Center, UC San Diego   December 2016 - July 2017

HPC Containerization Research Assistant   *San Diego, CA*

· Developed software for the Comet supercomputer and explored the capabilities and limitations of Singularity containers in HPC–supervised by Dr. A. Majumdar.

TECHNICAL SKILLS

Programming	Python (+ PyTorch), C++, Shell Scripting
Robotics	Sensor Fusion, Scene Modeling, Behavior Prediction, AI Planning
Machine Learning	SVM, PCA, LDA, EM, Deep Generative Models, Reinforcement Learning
Software Tools	ROS, PCL, Docker, IsaacSim

RESEARCH HIGHLIGHTS AND ARTICLES

- Self-Driving Mail Delivery Begins on Campus (2019)

- Improved Maps for Self-Driving Vehicles Win Research Expo (2021)

- NSF Invests $20M in UC San Diego-headquartered Artificial Intelligence (AI) Research Institute (2021)

- UC San Diego work presented at NVIDIA GTC: Societal Mega Trends and Its Impact on Robotics & AI (2022)

- NSF Invests $20M in UC San Diego-headquartered Artificial Intelligence (AI) Research Institute (2021)

- Mapless Solutions at Bosch: Promoting assisted driving (2025)

LEADERSHIP AND PROFESSIONAL ACTIVITIES

International Foundation of Robotics Research   2020-2022
Colloquia Organizer and Producer   *San Diego, CA*

· Organized 25 virtual colloquia on robotics related topics including field robotics, aerial robotics, and autonomous driving.
· Information about presentations hosted can found at ifrr.org. The recordings are also publicly available on the IFRR YouTube channel.

Robotic Graduate Student Organization (RoboGrads)   2021-2023
Social Chair and President   *San Diego, CA*

· Organized social events and bi-weekly seminars across the robotics graduate student community to promote collaboration and networking.
· Connected with tech. companies and organized joint networking events, campus visits, and presentations with students at the Contextual Robotics Institute.
· Organized high school and visiting student group tours for various robotics labs at UC San Diego.

FIRST Tech Competition   Feb. 2023
Judge - Volunteer

IEEE - Eta Kappa Nu (HKN)   2017-2023
Member and Mentor

PEER REVIEW

IEEE International Conference on Robotics and Automation (ICRA)
2023-2026

IEEE Robotics and Automation Letters (RA-L)
2025

IEEE International Conference on Intelligent Robots and Systems (IROS)
2021, 2023, 2024

IEEE International Conference on Automation Science and Engineering (CASE)
2022

IEEE Transactions on Artificial Intelligence (TAI)
2024

IEEE/CVF Computer Vision and Pattern Recognition (CVPR)
2026

MENTORSHIP EXPERIENCE

Autonomous Vehicle Lab

M.Sc. Students Mentored.

1. Sumukha Harish (2018-2019): State-based PID controllers and Camera-LiDAR calibration.
2. Hengyuan Zhang (2018-2020): LiDAR based perception.
3. Shawn Winston (2018-2019): ROS driver development for Inertial Navigation System.
4. Nathan Chan (2018-2019): Autonomous mail delivery, HD map generation, and bench-marking.
5. Qinru Li (2020): Semantic segmentation for urban driving.
6. Yuqing Jiang (2019): Bench-marking for autonomous driving.
7. Yuhan Liu (2020-2021): Automatic camera calibration.
8. Yunhai Han (2020-2021): Automatic camera calibration.
9. Hao Xiang (2020-2021): Road user trajectory forecasting.
10. Srinidhi Srinivas (2021-2023): Dynamic Scene Modeling.
11. Jing-yan Liao (2021-2023): Anonymizing Pedestrian Identities, Behavior Modeling
12. Seth Farrell (2022-2023): Systems and Software Integration.
13. Zihan Zhang (2022-2023): Monocular Depth Estimation, Behavior Modeling
14. Varun Vupparige (2022-2023): Dynamic Overtaking in Urban Roads
15. Kai Chuen Tan (2022): Dynamic Overtaking in Urban Roads

Bosch Center for AI

· **Ph.D. Interns Supervised.**

1. Hengyuan Zhang - UCSD (2023-2024): Prior learning and 3DGS for online mapping.
2. Junjie Ye - USC (2024): Learning priors to boost offline and online topology generation.
3. Cevahir Koprulu. - Univ. of Texas (2025): Utility design for Self-Play and Curriculum Learning.
4. Dingyi Zhuang - MIT (2025): Self-supervision for online map and topology refinement (co-advised).
5. Kevin Chen - USC (2025): 3D scene reconstruction from sparse views (co-advised).

PUBLICATIONS

1. Zixuan Wu, Hengyuan Zhang, Ting-Hsuan Chen, Yuliang Guo, **David Paz**, Xinyu Huang, and Liu Ren. Dino-diffusion modular designs bridge the cross-domain gap in autonomous parking. *arXiv preprint arXiv:2510.20335*, 2025

2. Hengyuan Zhang, **David Paz**, Yuliang Guo, Xinyu Huang, Henrik I Christensen, and Liu Ren. Mapgs: Generalizable pretraining and data augmentation for online mapping via novel view synthesis. *arXiv preprint arXiv:2501.06660*, 2025

3. Junjie Ye, **David Paz**, Hengyuan Zhang, Yuliang Guo, Xinyu Huang, Henrik I Christensen, Yue Wang, and Liu Ren. Smart: Advancing scalable map priors for driving topology reasoning. *arXiv preprint arXiv:2502.04329*, 2025

4. Jing-Yan Liao, Parth Doshi, Zihan Zhang, **David Paz**, and Henrik Christensen. Osm vs hd maps: Map representations for trajectory prediction. In *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 9990–9996, 2024

5. Hengyuan Zhang, **David Paz**, Yuliang Guo, Arun Das, Xinyu Huang, Karsten Haug, Henrik I. Christensen, and Liu Ren. Enhancing online road network perception and reasoning with standard definition maps. In *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1086–1093, 2024

6. **David Paz**, Hengyuan Zhang, Hao Xiang, Andrew Liang, and Henrik I. Christensen. Conditional generative models for dynamic trajectory generation and urban driving. *Sensors*, 23(15), 2023

7. Hengyuan Zhang, Shashank Venkatramani, **David Paz**, Qinru Li, Hao Xiang, and Henrik I. Christensen. Probabilistic semantic mapping for autonomous driving in urban environments. volume 23, 2023

8. Hengyuan Zhang, Jing-Yan Liao, **David Paz**, and Henrik I. Christensen. Robust human identity anonymization using pose estimation. In *2022 IEEE 18th International Conference on Automation Science and Engineering (CASE)*, pages 619–626, 2022

9. **David Paz**, Hao Xiang, Andrew Liang, and Henrik I Christensen. Tridentnetv2: Lightweight graphical global plan representations for dynamic trajectory generation. In *International Conference on Robotics and Automation*, Philadelphia, May 2022. IEEE

10. Henrik Christensen, **David Paz**, Hengyuan Zhang, Dominique Meyer, Hao Xiang, Yunhai Han, Yuhan Liu, Andrew Liang, Zheng Zhong, and Shiqi Tang. Autonomous vehicles for micromobility. In *Autonomous Intelligent Systems*, 2021

11. **David Paz**, Henry Zhang, and Henrik I Christensen. TridentNet: A conditional generative model for dynamic trajectory generation. In *Intelligent Autonomous Systems-16*, Singapore, June 2021. (**Best paper**)

12. Yunhai Han, Yuhan Liu, **David Paz**, and Henrik Christensen. Auto-calibration method using stop signs for urban autonomous driving applications. In *International Conference on Robotics and Automation*, Xian, May 2021. IEEE

13. **David Paz**, Hengyuan Zhang, Qinru Li, Hao Xiang, and Henrik Christensen. Probabilistic semantic mapping for urban autonomous driving applications. In *International Conference on Intelligent Robots and Systems (IROS)*, Las Vegas, NV, Oct 2020. IEEE/RSJ

14. **David Paz**. Autonomous vehicles: Their capabilities and limitations. In *UC San Diego Electronic Theses and Dissertations*, 2020

15. **David Paz**, Po jung Lai, Nathan Chan, Yuqing Jiang, and Henrik I. Christensen. Autonomous vehicle benchmarking using unbiased metrics. In *International Conference on Intelligent Robots and Systems (IROS)*, Las Vegas, NV, Oct 2020. IEEE/RSJ

16. **David Paz**, Po-Jung Lai, Sumukha Harish, Hengyuan Zhang, Nathan Chan, Chun Hu, Sumit Binnani, and Henrik Christensen. Lessons learned from deploying autonomous vehicles at UC San Diego. In *Field and Service Robotics*, Tokyo, JP, August 2019

17. Emily Le and **David Paz**. Performance analysis of applications using singularity container on sdsc comet. In *Proceedings of the Practice and Experience in Advanced Research Computing 2017 on Sustainability, Success and Impact*, PEARC17, pages 66:1–66:4, New York, NY, USA, 2017. ACM