

## Cover Letter

My name is Han Wang, and I am currently completing my Ph.D. in Berkeley Artificial Intelligence Research at UC Berkeley, advised by Prof. Maria Laura Delle Monache and Prof. Alexandre Bayen. My research focuses on Autonomous Driving and Multi-Agent Systems. I am writing to inquire about potential postdoctoral opportunities in your esteemed research group.

My doctoral research has primarily revolved around multi-agent systems and vehicular automation technologies. One of my significant contributions has been as a leading researcher in the Congestion Impacts Reduction via CAV-in-the-loop Lagrangian Energy Smoothing (CIRCLES) project. This groundbreaking project involved the world's largest open-track field test with 100 autonomous vehicles (AVs) on the I-24 highway during morning peak hours.

As the lead for the centralized speed planner, I was responsible for developing and deploying the real-time speed optimization algorithm for all 100 AVs. This involved enhancing traffic state estimation (TSE) using data from INRIX and real-time vehicle telemetry to provide accurate, up-to-the-minute traffic assessments. I also developed a hierarchical control architecture integrating server-side algorithms with vehicle-side execution, which allowed dynamic adjustment of speed limits based on both current and predictive traffic conditions. The field test results were remarkable, showing an overall 8% traffic density decrease, with a specific decrease of 7% upstream, 10% downstream, and a 52% decrease during the congestion formation phase at bottlenecks.

Additionally, I have worked on the Predictive Occupancy Risk Assessment (PORA) project, which focuses on enhancing AV conflict prediction by generating probabilistic risk metrics from vehicle trajectory data. This project integrates stochastic modeling and machine learning techniques to improve real-time decision-making capabilities in autonomous systems.

More information about my other projects and publications can be found in the resume attached, as well as on my website:

<https://hanwcal.github.io/>

I would be honored to discuss available opportunities in your team. Thank you for considering my inquiry. I look forward to contributing to your research endeavors.

Best regards,

Han Wang  
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