

APRIL 9**TBD WEBINAR+ SERIES****Physics-Informed Learning and Control for Mixed
Autonomy Systems: Application to Traffic Smoothing****REGISTER TODAY** <https://tinyurl.com/yn8swhdm>

US Pacific/Arizona: April 9, 2026 at 12:00 PM

US Central/Austin: April 9, 2026 at 2:00 PM

US East/New York: April 9, 2026 at 3:00 PM

ABOUT THE TALK

Mixed-autonomy systems, where automated and human agents coexist, are already emerging in real-world cyber-physical systems. A key challenge in these systems is how to leverage a small number of automated agents to influence overall system behavior under nonlinear dynamics, behavioral uncertainty, and partial observability. This talk presents a model-informed co-design framework that integrates physics-informed learning, control design, and real-world experimentation for mixed-autonomy systems. Using traffic flow smoothing as a specific case, it will be shown how Neural Finite Volume Methods enable accurate and data-efficient modeling of traffic dynamics, and how kernel-based and imitation-learning control strategies allow a few automated vehicles to dissipate stop-and-go waves while maintaining throughput. These methods are validated through the largest scientific traffic field experiment to date, involving 100 automated vehicles on public highways, demonstrating measurable improvements in traffic stability and energy efficiency.

ZHE FU**UNIVERSITY OF CALIFORNIA, BERKELEY**

Zhe Fu is a final-year Ph.D. candidate in Transportation Engineering and M.S. candidate in Electrical Engineering and Computer Sciences (EECS) at UC Berkeley, advised by Prof. Alexandre Bayen at Berkeley Artificial Intelligence Research (BAIR) Lab. Her research focuses on learning, control, and modeling for distributed parameter systems, with an emphasis on mixed autonomy. She develops physics-informed neural models of hyperbolic PDEs, designs both model-based and data-driven control algorithms, and validates them through large-scale field experiments. Zhe has been recognized as a 2025 Eno Fellow and was the Runner-up in the 2025 Berkeley Grad Slam. Her research has received honors across communities, including First Place in the INFORMS Poster Competition (2023) and Rising Stars awards in Mechanical Engineering (2024 by CMU), EECS (2025 by MIT), and CPS (2025 by NSF). Her leadership, mentorship, and teaching efforts have been recognized by UC Berkeley and organizations such as ITS/CTF, EDGE in Tech, H2H8 and AAa/e. Learn more at <https://fu-zhe.com/>



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