Computer Science
Seminar Series – Spring 2026

Physical AI Infrastructure for the Edge-HPC Continuum.

Wednesday, November 18th, 2026, 1:00pm - 2:00pm PST Time

Room 8-51.

Abstract

The convergence of artificial intelligence, ubiquitous sensing, and high-performance computing is creating new opportunities for intelligent systems that interact with and adapt to the physical world. However, these systems must operate across highly heterogeneous computing environments, under constraints imposed by limited resources, intermittent connectivity, and changing physical conditions. Meeting these challenges requires rethinking how we design and manage computing infrastructure. In this talk, I will overview our research on distributed systems that bridge the physical and digital worlds, culminating in PHYSIQ (PHYSical Intelligence with Quantified utility), our emerging infrastructure for adaptive physical AI. PHYSIQ explores a fundamental shift from executing computation whenever resources are available to performing computation only when its expected application benefit justifies its cost. By dynamically coordinating sensing, inference, simulation, and learning across the edge–HPC continuum, we aim to enable intelligent, efficient, and resilient physical AI systems. I will discuss the systems challenges, architectural approaches, and real-world applications motivating this research.

Bio

Chandra Krintz is a Professor of Computer Science at the University of California, Santa Barbara (UCSB) and co-founder of AppScale Systems, Inc. She joined the UCSB faculty in 2001 after receiving her M.S. and Ph.D. degrees in Computer Science from the University of California, San Diego (UCSD). Chandra has led a number of different research projects that have advanced the state-of-the-art in programming and distributed systems in ways that improve performance, reduce energy consumption, and simplify the software development and deployment lifecycle. Recently, her work has focused on intelligent infrastructure for physical systems (PHYSIQ), which spans IoT, AI, HPC, and edge and cloud computing with applications in farming, ranching, and conservation science (cf SmartFarm and WTB). Chandra has advised over 100 undergraduate and graduate students, has published numerous research articles in a wide range of top venues, and participates in efforts to broaden participation in computing. Chandra's efforts have been recognized via an NSF CAREER award, the CRA-W Anita Borg Early Career Award, a UCSB Academic Senate Distinguished Teaching Award, and as a UCSB Sustainability Champion.



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