Dissertation Defense
Date/Time: Wednesday, January 21, 2026 at 11am PT
Location: Clark Center, Auditorium (318 Campus Drive, Stanford, CA 94305)

Priya Nair, Department of Bioengineering
Alison Marsden and Daniel Ennis, advisors

Title: Computational and Experimental Approaches for Assessing Hemodynamics in Patients with Coarctation of the Aorta

Abstract: Coarctation of the aorta (CoA) is a congenital heart defect characterized by a segmental constriction of the aorta. It accounts for 6-8% of all congenital heart defects and if left untreated, it can lead to abnormal pressure gradients, disturbed flow patterns, and long-term cardiovascular risk. By the current clinical standard, a blood pressure gradient ≥ 20 mmHg at rest across the CoA warrants corrective intervention such as reconstructive surgery or catheter-based stenting. While cardiac catheterization remains the clinical gold standard for pressure gradient estimation, it is inherently invasive, while non-invasive imaging and surrogate metrics fail to capture patient-specific, flow-dependent hemodynamic features.