Stanford

Lorenzo Ferrari

Postdoctoral Scholar, Cardiothoracic Surgery

Bio

BIO

Lorenzo Ferrari, PhD, is a biomedical engineer interested in cardiovascular flows and in developing benchtop systems for in vitro evaluation of cardiac devices. His current postdoctoral research in the Department of Cardiothoracic Surgery at Stanford University focuses on simulating and testing transcatheter valves implanted in the right ventricular outflow tract using 4D Flow MRI, working with Doff B. McElhinney, Daniel B. Ennis, and Alison L. Marsden. He obtained his PhD summa cum laude in Biomedical Engineering from the University of Bern, where he investigated the influence of heart valve design and size under different hemodynamic conditions using particle velocimetry techniques. During his PhD, he completed a secondment at the University of Twente in the Physics of Fluids group at the Max Planck Center for Complex Fluid Dynamics, collaborating with Michel Versluis and Guillaume Lajoinie to assess the stability of flow fields past valve prostheses.

INSTITUTE AFFILIATIONS

- Member, Maternal & Child Health Research Institute (MCHRI)

HONORS AND AWARDS

- UniBE Short Travel Grant for (Post)Docs, University of Bern (04/2024)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Reviewer, Annals of Biomedical Engineering (2024 - present)

PROFESSIONAL EDUCATION

- Bachelor of Engineering, Politecnico Di Milano (2018)
- Doctor of Philosophy, University of Bern , Biomedical Engineering (2025)
- Master of Engineering, Politecnico di Milano , Biomedical Engineering (Biomechanics and Biomaterial) (2021)

STANFORD ADVISORS

- Doff McElhinney, Postdoctoral Faculty Sponsor

Publications

PUBLICATIONS

- **Evaluation of extra-corporeal membrane oxygenator cannulae in pulsatile and non-pulsatile pediatric mock circuits.** *Artificial organs*
  Ferrari, L., Bartkevics, M., Jenni, H., Kadner, A., Siepe, M., Obrist, D.
  2025; 49 (3): 420-430

- **Influence of valve size on the hemodynamic performance of a tissue-engineered valved conduit in pulmonary position** *Frontiers in Bioengineering and Biotechnology*
  Ferrari, L., Cox, M., Obrist, D.
  2025; 13

- **Comparison of 4D flow MRI and computational fluid dynamics in carotid models with different stenosis levels.** *Computers in Biology and Medicine*
  Mokhtari, A., Corso, P., Jung, B., Ferrari, L., Zheng, S., Obrist, D.
  2025

- **Comparison of Hemodynamic Performance, Three-Dimensional Flow Fields, and Turbulence Levels for Three Different Heart Valves at Three Different Hemodynamic Conditions.** *Annals of biomedical engineering*
  Ferrari, L., Obrist, D.
  2024; 52 (12): 3196-3207

- **Hemodynamic effects of a dielectric elastomer augmented aorta on aortic wave intensity: An in-vivo study.** *Journal of biomechanics*
  Jahren, S. E., Martinez, T., Walter, A., Ferrari, L., Clavica, F., Obrist, D., Civet, Y., Perriard, Y.
  2023; 159: 111777

- **A novel soft cardiac assist device based on a dielectric elastomer augmented aorta: An in vivo study.** *Bioengineering & translational medicine*
  Martinez, T., Jahren, S. E., Walter, A., Chavanne, J., Clavica, F., Ferrari, L., Heinisch, P. P., Casoni, D., Haeberlin, A., Luedi, M. M., Obrist, D., Carrel, T., Civet, et al
  2023; 8 (2): e10396