

# Stanford

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## Luca Pegolotti

Postdoctoral Scholar, Cardiology

### Bio

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#### BIO

Luca Pegolotti is a Postdoc in the Cardiovascular Biomechanics Computation Lab led by Prof. Alison Marsden. He is interested in data-driven model order reduction techniques for cardiovascular simulations. His areas of expertise include scientific computing, high-performance computing, and deep learning.

Luca Pegolotti completed a BCs in Mathematical Engineering at Politecnico di Milano in 2014 and a MSc in Computational Science and Engineering at the École polytechnique fédérale de Lausanne (EPFL) in 2017. He graduated with a PhD in Mathematics at EPFL in 2020 under the supervision of his PhD advisor, Prof. Simone Deparis. In his thesis, "Reduction techniques for PDEs built upon Reduced Basis and Domain Decomposition Methods with applications to hemodynamics", he focuses on projection-based model order reduction methods for cardiovascular flow.

#### STANFORD ADVISORS

- Alison Marsden, Postdoctoral Faculty Sponsor

### Research & Scholarship

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#### RESEARCH INTERESTS

- Data Sciences
- Research Methods

### Publications

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#### PUBLICATIONS

- **Deep Neural Network to Accurately Predict Left Ventricular Systolic Function Under Mechanical Assistance** *FRONTIERS IN CARDIOVASCULAR MEDICINE*  
Bonnemain, J., Zeller, M., Pegolotti, L., Deparis, S., Liaudet, L.  
2021; 8: 752088
- **Model order reduction of flow based on a modular geometrical approximation of blood vessels.** *Computer methods in applied mechanics and engineering*  
Pegolotti, L., Pfaller, M. R., Marsden, A. L., Deparis, S.  
2021; 380
- **Implementation and Calibration of a Deep Neural Network to Predict Parameters of Left Ventricular Systolic Function Based on Pulmonary and Systemic Arterial Pressure Signals** *FRONTIERS IN PHYSIOLOGY*  
Bonnemain, J., Pegolotti, L., Liaudet, L., Deparis, S.  
2020; 11: 1086
- **Data driven approximation of parametrized PDEs by reduced basis and neural networks** *JOURNAL OF COMPUTATIONAL PHYSICS*

Dal Santo, N., Deparis, S., Pegolotti, L.

2020; 416

- **Application of the Rosenbrock methods to the solution of unsteady 3D incompressible Navier-Stokes equations** *COMPUTERS & FLUIDS*

Deparis, S., Deville, M. O., Menghini, F., Pegolotti, L., Quarteroni, A.

2019; 179: 112-122

- **Isogeometric Analysis of the electrophysiology in the human heart: Numerical simulation of the bidomain equations on the atria** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*

Pegolotti, L., Dede, L., Quarteroni, A.

2019; 343: 52-73

- **Coupling non-conforming discretizations of PDEs by spectral approximation of the Lagrange multiplier space** *ESAIM: M2AN*

Deparis, S., Iubatti, A., Pegolotti, L.

2019; 53 (5): 1667 - 1694