FEDERICO PICHI

PERSONAL INFORMATION

Born in Rome, Italy 23 February 1992

Ph.D. in Mathematical Analysis, Modelling and Applications

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POSITION

Current Position

PostDoc researcher at SISSA (International School for Advanced Studies) and EPFL (École Polytechnique Fédérale de Lausanne) with CRUI fellowship. Member of mathLab group, Mathematics Area, via Bonomea 265, Trieste, Italy.

Research Interests

Numerical analysis of bifurcating phenomena held by non-linear equations. Reduced order models in computational Continuum Mechanics, Fluid Dynamics and Quantum Mechanics with applications to Artificial Neural Networks, Optimal Control Problems and Fluid-Structure Interaction.

PUBLICATIONS

[8] "Artificial neural network for bifurcating phenomena modelled by nonlinear parametrized PDEs"
F. Pichi, F. Ballarin, G. Rozza, J. S.Hesthaven.
In: Preprint.

[7] "A successive partition method for the efficient evaluation of parametrized stability factors"
F. Ballarin, F. Pichi, G. Rozza.
In: Preprint.

[6] "Driving bifurcating parametrized nonlinear PDEs by optimal control strategies: application to Navier-Stokes equations and model reduction"
F. Pichi, M. Strazzullo, F. Ballarin, G. Rozza.
In: arXiv 2010.13506.

[5] "Reduced order models for the buckling of hyperelastic beams."
F. Pichi, J. Eftang, G. Rozza, A. T. Patera.
In: Report MIT-FVG ROM2S

[4] "Efficient computation of bifurcation diagrams with a deflated approach to reduced basis spectral element method"
M. Pintore, F. Pichi, M. Hess, G. Rozza, C. Canuto.
In: Advances in Computational Mathematics, 47:1, 2021.

[3] "A Reduced Order technique to study bifurcating phenomena: application to the Gross-Pitaevskii equation"
F. Pichi, A. Quaini, G. Rozza.
In: SIAM Journal on Scientific Computing, 42:5, B1115-B1135, 2020.

[2] "Reduced basis approaches for parametrized bifurcation problems held by non-linear von Kármán equations"
F. Pichi, G. Rozza.
In: Journal of Scientific Computing, 10.1007/s10915-019-01003-3, 2019.

[1] "Reduced Basis Approximation and A Posteriori Error Estimation: Applications to Elasticity Problems in Several Parametric Settings"
D.B.P. Huynh, F. Pichi and G. Rozza.
In: Numerical Methods for PDEs: State of the Art Techniques, Springer International Publishing, Ch. 8, 203–247, 2018.

EDUCATION

2016-2020 SISSA, Trieste (Italy)

Ph.D. degree

Mathematical Analysis, Modelling and Applications · Mathematics Area
Thesis: *Reduced order models for parametric bifurcation problems in nonlinear PDEs*
Advisors: Prof. Gianluigi Rozza & Dr. Francesco Ballarin
Final Grading *cum laude*

2014-2016 'La Sapienza' University, Rome (Italy)

Master degree

Applied Mathemathics · Department of Mathematics
Thesis: *Reduced order methods for parametric Von Kármán equations*
Advisors: Prof. Maurizio Falcone & Prof. Gianluigi Rozza
Final Grading *110/110 cum laude*

OTHER INFORMATION

Teaching and Tasks

Lecturer - "Reduced order modelling in bifurcating parametrised non-linear equations", SISSA, Trieste, 2019.

Matlab - Bachelor Degree in Mathematics, University of Trieste, 2019.

Co-advisor - Master thesis of Moreno Pintore, "Efficient Computation of Bifurcation Diagrams with Spectral Element Method and Reduced Order Models". Master degree in Mathematical Engineering, Politecnico di Torino, Italy (Oct. 2019).

Co-advisor - Master thesis of Moaad Khamlich, "Reduced order models for bifurcating phenomena in Fluid-Structure Interaction problems". Master degree in Mathematical Engineering, Politecnico di Milano, Italy, ongoing.

President SISSA Siam Student Chapter (2019-2020)

Reviewer International Journal of Bifurcation and Chaos, AMS Math. Reviews

Organizer SISSA SIAM Student Chapter Colloquia 2020, Virtual Event

Awards and Funding

2021 CRUI project GO for IT · Research grant between EPFL and SISSA: "Reduced order method for nonlinear PDEs enhanced by machine learning"

2020 ECCOMAS Scholarship · Grant for WCCM-ECCOMAS Virtual Congress

2019 Banco Santander Financial Support Program · Grant for 9th International Congress on Industrial and Applied Mathematics ICIAM2019

2018 MIT-Italy - FVG Project · ROM2S Reduced Order Methods at MIT and SISSA

SISSA · Master thesis fellowship for pre-graduate students

Sapienza University · Excellence course for Master degree in Applied Mathematics 2014-2016

Sapienza University · Excellence course for Bachelor degree in Mathematics 2011-2014

Conferences and Workshops

WCCM-ECCOMAS 2020 (talk), MORSS 2020 (talk), SAMM 2020 - (poster), UMI 2019 - (talk), ICIAM 2019 - (talk), ROM in CFD - (poster), CIME-EMS Summer School, ICOSAHOM 2018 - (talk), MoRePaS 2018 - (poster), QUIET 2017, FEF 2017, EU-MORNET.

February 5, 2021