

Davide Pradovera

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Born: October 9, 1993—Piacenza, Italy.
Nationality: Italian.

Current position

Post-doctoral researcher, CSQI, EPFL, Lausanne.

Areas of specialisation

Numerical mathematics for partial differential equations, approximation theory, model order reduction, frequency-domain applications, scattering problems.

Appointments held

- 2014–2017 [*Special courses teacher*, Piacenza (I).
- 2016 [*Developer intern*, Iren S.p.A., Piacenza (I).
- 2017–2021 [*Doctoral assistant*, EPFL, Lausanne (CH).
- 2022–present [*Post-doctoral researcher*, EPFL, Lausanne (CH).

Education

- 2012–2015 [*B.Sc. in Applied Mathematics (cum laude)*, Politecnico di Milano, Milan (I).
Thesis: “A mathematical justification of the momentum operator in quantum mechanics”.
Advisor: Prof. M. Verri.
- 2015–2017 [*M.Sc. in Computational Science and Engineering*, EPFL, Lausanne (CH).
Project: “Implementation of smooth contact mechanics with the mortar method”.
Advisor: Prof. G. Anciaux.
Project: “Finite elements-based Padé approximants for Helmholtz frequency response problems”.
Advisor: Prof. F. Nobile.
Thesis: “Randomized low-rank approximation of matrices and tensors”.
Advisor: Prof. D. Kressner.
- 2017–2021 [*Ph.D. in Mathematics*, EPFL, Lausanne (CH).
Thesis: “Model order reduction based on functional rational approximants for parametric PDEs with meromorphic structure”.
Advisor: Prof. F. Nobile.

Grants, honours, & awards

- 2011 [3rd place at the “Hong Kong International Science Fair”.
- 2013 [4th place in the “Championnat International des Jeux Mathématiques et Logiques”.
- 2014 [5th place in the “Championnat International des Jeux Mathématiques et Logiques”.
- 2017 [Douchet prize for best GPA, MATH-EPFL.
- 2021 [Junior Research Fellowship at ESI Vienna.

Publications and talks

Journal articles

- 2019 [F. Bonizzoni and DP, “Distributed sampling for rational approximation of the acoustic scattering of an airfoil”, PAMM 19.
- 2020 [F. Bonizzoni, F. Nobile, I. Perugia, and DP, “Fast Least-Squares Padé approximation of problems with normal operators and meromorphic structure”, Math. Comput. 89.
F. Bonizzoni, F. Nobile, I. Perugia, and DP, “Least-Squares Padé approximation of parametric and stochastic Helmholtz maps”, Adv. Comput. Math. 46.
[DP, “Interpolatory minimal rational model order reduction of parametric problems lacking uniform inf-sup stability”, SIAM J. Numer. Anal. 58.
- 2021 [F. Bonizzoni and DP, “Shape optimization for a noise reduction problem by non-intrusive parametric reduced modeling”, Proc. WCCM-ECCOMAS2020.
[F. Nobile and DP, “Non-intrusive double-greedy parametric model reduction by interpolation of frequency-domain rational surrogates”, ESAIM:M2AN 55.
- 2022 [DP and F. Nobile, “A technique for non-intrusive greedy piecewise-rational model reduction of frequency response problems over wide frequency bands”, J. Math. Ind. 12.

Pending articles

- 2020 [DP and F. Nobile, “Frequency-domain non-intrusive greedy Model Order Reduction based on minimal rational approximation”, to appear in SCEE 2020 Proc..
- 2021 [F. Bonizzoni, DP, and M. Ruggeri, “Rational-based model order reduction of Helmholtz frequency response problems with adaptive finite element snapshots”, under review.

Presentations at conferences

- 2019 [DP, F. Nobile, F. Bonizzoni, and I. Perugia, “A technique for rational model order reduction of parametric problems lacking uniform inf-sup stability”, GAMM 2019, Vienna (A).
DP, F. Nobile, F. Bonizzoni, and I. Perugia, “A technique for rational model order reduction of parametric problems lacking uniform inf-sup stability”, ICIAM 2019, Valencia (E).
[DP and F. Nobile, “Interpolatory rational model order reduction of parametric problems lacking uniform inf-sup stability”, ENUMATH 2019, Egmond aan Zee (NL).
- 2021 [DP, F. Nobile, and F. Bonizzoni, “Non-intrusive model reduction of parametric frequency response problems via minimal rational interpolation”, ICOSAHOM 2020/2021 (virtual), Vienna (A).
DP and F. Nobile, “Non-intrusive model reduction of parametric frequency-response problems – with applications to UQ”, SIMAI 2020+2021, Parma (I).

Posters

- 2018 [F. Bonizzoni, I. Perugia, F. Nobile, and DP, “An efficient algorithm for Padé-type approximation of the frequency response for the Helmholtz problem”, MoRePaS IV, Nantes (F).
 - [F. Bonizzoni, I. Perugia, F. Nobile, and DP, “An efficient algorithm for Padé-type approximation of the frequency response for the Helmholtz problem”, Swiss Numerics Day 2018, Zurich (CH).
- 2020 [DP and F. Nobile, “Frequency-domain non-intrusive greedy Model Order Reduction based on minimal rational approximation”, SCEE 2020, Eindhoven (NL).
 - [DP and F. Nobile, “Frequency-domain non-intrusive greedy Model Order Reduction based on minimal rational approximation”, MORSS 2020 (virtual), Lausanne (CH).

Others

- 2018 [DP, F. Nobile, F. Bonizzoni, and I. Perugia, “Fast Least-Squares Padé approximation of self-adjoint problems with meromorphic structure”, seminar, MATHICSE retreat, Sainte-Croix (CH).
 - [DP, F. Nobile, F. Bonizzoni, and I. Perugia, “Fast Least-Squares Padé approximation of self-adjoint problems with meromorphic structure”, workshop talk, DRWA, Alba di Canazei (I).
- 2019 [DP and F. Nobile, “Polynomial approximation of resonance manifolds”, short seminar, MATHICSE retreat, Champéry (CH).
- 2020 [DP, “Padé approximation: a quick overview”, seminar (virtual), CSQI talks, Lausanne (CH).
 - DP, “From Padé approximation to rational interpolation”, seminar (virtual), CSQI talks, Lausanne (CH).
 - DP, “Minimal rational approximation”, seminar (virtual), CSQI talks, Lausanne (CH).
 - [DP, “Minimal rational approximation: a model reduction tool for parametrized PDEs with resonances”, seminar (virtual), PDE Afternoons, Vienna (A).
- 2021 [DP, “Matching-based pMOR for dynamical systems”, seminar (virtual), CSQI talks, Lausanne (CH).

Teaching experience

- 2017 [Analyse avancée I, Mathematics, EPFL.
 - 2018 [Analyse numerique, Mechanical Engineering, EPFL.
 - [Analyse fonctionnelle, Mathematics, EPFL.
 - 2019 [Introduction to partial differential equations, Mathematics, EPFL.
 - 2021 [Numerical analysis and computational mathematics, Computational Sciences, EPFL.
 - 2019–2021 [Parallel and high-performance computing, Computational Sciences, EPFL.
- (Including preparation of course&exercise material, preparation and grading of assignments&exams.)

Other service

- 2019 [Supervision of B.Sc. thesis: “Approximation numérique du spectre des opérateurs elliptiques d’ordre deux” by T. Chanay, EPFL.
- 2020 [Conference organizer, Model Order Reduction Summer School 2020 (virtual event).
 - [Referee for scientific journals: Advances in Computational Mathematics.

Computer skills

Advanced [Matlab, C/C++, OpenMP, MPI, Python, FreeFem++, ~~La~~TeX.
Intermediate [CUDA, C#, HTML.
Basic [R, OpenFOAM, Fluent, Fortran, Java.

Languages

Italian:	Mothertongue	English:	Fluent
French:	Intermediate	Japanese:	Basic
German:	Basic		

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