

Davide Pradovera

Office 09.128, University of Vienna
Oskar-Morgenstern-Platz 1
1090 Vienna, Austria

Mobile: +41 077 95 88 993

Emails: davide.pradovera@univie.ac.at
davidepradovera@gmail.com

URLs: <https://pradovera.github.io>
<https://orcid.org/0000-0003-0398-1580>



Born on October 9, 1993, in Piacenza, Italy.
Nationality: Italian.

Current position

University assistant and post-doctoral researcher, Chair of Numerics of PDEs, University of Vienna.

Areas of specialization

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 [*Post-doctoral researcher*, EPFL, Lausanne (CH).
- 2022–now [*University assistant and post-doctoral researcher*, University of Vienna, Vienna (A).

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. Ancaux.
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, honors, and 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.
 2020 [Prize for exceptional teaching service, Section of Mathematics, 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*.
 DP and F. Nobile, “Frequency-domain non-intrusive greedy Model Order Reduction based on minimal rational approximation”, *Sci. Comput. Electr. Eng.* 36.
 [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

- 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, MATH-ICSE 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).
- 2022 [DP, “Surrogate modeling of parametric frequency response problems via locally adaptive sparse grids”, workshop talk, “Approx. of high-dim. param. PDEs in forward UQ” ESI workshop, Vienna (A).

Teaching experience

- 2017 [Analyse avancée I, Mathematics, EPFL.
- 2018 [Analyse numérique, 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.
2022 [Supervision of M.Sc. project: “Rational approximation for the frequency response of the time-harmonic Maxwell’s equations” by F. Matti, EPFL.

Computer skills

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

Languages

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

• Last updated: May 4, 2022 • Vienna •