Evert Provoost

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Research Interests and Expertise

The primary research focus is on developing numerical methods to analyse infinite dimensional dynamical systems, particularly those governed by delay differential (algebraic) equations. The main approach involves applying the tools from approximation theory and numerical analysis to transform these infinite dimensional problems into finite dimensional approximations. These approximations are then analysed using efficient algorithms from numerical linear algebra.

Keywords: dynamical systems; time-delay systems; numerical analysis; approximation theory; numerical linear algebra.

Education

2022–now	Doctor of Philosophy, Computer Science Supervised by Wim Michiels KU Leuven
2020–'22	Master of Science, Mathematical Engineering KU Leuven
2017–'20	Bachelor of Science, Computer Science KU Leuven

Publications

- P. and Wim Michiels, 'Accelerated H^2-norm approximation of time-delay systems with discrete delays', *IFAC-PapersOnLine*, 59/11 (2025), 93–8.
- P. and Wim Michiels, 'The Lanczos tau framework for time-delay systems: Padé approximation and collocation revisited', *SIAM Journal on Numerical Analysis*, 62/6 (2024), 2529–48.

Talks and seminars

- 'Accelerated H^2-norm approximation for time-delay systems with discrete delays', *19th IFAC Workshop on Time-Delay Systems*, Gif-sur-Yvette, France (invited talk, July 2025).
- 'Efficient H^2-norm optimization of time-delay systems with algebraic constraints', *NUMA Seminar*, KU Leuven, Leuven, Belgium (internal seminar, December 2024).
- 'The Lanczos tau framework for time-delay systems', *18th IFAC Workshop on Time-Delay Systems*, Udine, Italy (invited talk, September 2024).
- 'The Lanczos tau framework for time-delay systems', *6^{e} Journées Approximation*, Lille, France (poster session, May 2024).
- 'The Lanczos tau framework for time-delay systems', *NUMA Seminar*, KU Leuven, Leuven, Belgium (internal seminar, March 2024).

– 'Computing the H^2-norm of delay differential algebraic systems', *42nd Benelux Meeting on Systems and Control*, Elspeet, The Netherlands (contributed talk, March 2023).

Scientific Service

2024–'25 Member of the Commission on Research Integrity, KU Leuven

2022–'24 Vice President of the SIAM Student Chapter KU Leuven

Science Communication

– Wim Michiels, P., Sanaz Akbarisisi, and Adrian Saldanha, *Time-Delay Systems in a Nutshell*, https://numa.cs.kuleuven.be/research/outreach-delay (2024, science outreach project about time-delay systems)

Contributions to Free and Open Source Software

– Refactored the xGEBAL routines of the LAPACK library
– Designed improved colouring schemes and implemented a suite of tools to display complex functions, to aide research and teaching: DomainColoring.jl and ComplexToys.jl

These and more can be found on https://github.com/eprovst.

Teaching at KU Leuven

2025 Teaching assistant for *Numerical Analysis*

2024–'25 Mentor of a master thesis on *Automatic accuracy and complexity optimization of matrix expressions*

2023 Guest lecture on 'Visual understanding of complex functions' for *Complex Analysis with Applications*

2022 & '23 Teaching assistant for *Problem solving and design, part 3*

2023–'24 Mentor of a master thesis on *Rational approximation methods for evaluating and approximating matrix functions*

2022–'25 Co-organizer of a half-yearly internal presentation skills workshop

2022 Organizer of a reading course on *Functional Analysis*

2018–'19 Peer assisted learning tutor

Other Service at KU Leuven

2024–'25 Member of the Academic Council and University Council

2024–'25 Member of the Executive Committee of the Group Science, Engineering and Technology

2024–'25 Member of the Library Council

2020–now Member of the Permanent Education Commission Mathematical Engineering

2020–'22 Member of the Departmental Council Computer Science

2019–'20 Observing Member of the Permanent Education Commission Computer Science