Thomas Trigo Trindade

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Education

Ecole Polytechnique Fédérale de Lausanne (EPFL), PhD in Applied Mathematics – Lausanne, Switzerland — Sept 2021 – Dec 2025
Thesis: Advances in Dynamical Low-Rank Approximations for random PDEs and Data Assimilation

- Topics : Uncertainty Quantification, Model Order Reduction, Data Assimilation

University of Edinburgh, MSc in Computational and Applied Mathematics – Edinburgh, UK — Sept 2020 – Aug 2021
Thesis: Multi-scale modelling & stochastic chemical kinetics

- Advisor : Konstantinos Zygalakis
- Award for Best Student in Computational Applied Mathematics 2020–2021

Université de Genève, BSc in Mathématiques et Sciences Informatiques – Geneva, Switzerland — Sept 2017 – June 2020

Experience

PhD Researcher, EPFL — 2021–2025

- Expertise in Dynamical Low-Rank Approximation methods in Uncertainty Quantification contexts (random PDEs, data assimilation)
- Contributions : PDE stability analysis of DLR schemes, error estimates, algorithm design and analysis ; DLR reduction of Kalman-Bucy processes, DLR-ENKF formulation, well-posedness analysis, applications to joint state/parameter identification problems
- Collaborated with applied mathematicians and engineers on algorithm design and interdisciplinary modelling tasks

Academic presentations, Conferences & Workshops — 2021–2025

- Mini-symposium speaker @ SIAM CSE 2023 Amsterdam, YIC 2023 Porto, ENUMATH 2023 Lisbon, SIAM UQ 2024 Trieste, YMMOR 2024 Stuttgart, SciCADE 2024 Singapore, INI 2025 Cambridge, SND 2025 Switzerland
- Poster presentations @ SWICCOMAS 2024 Switzerland, SND 2024 Switzerland, PFM 2025 Switzerland

Semester project and Master thesis supervision, EPFL — 2021–2025

- Bachelor semester project: Obstacle problem and Option Pricing
- Master thesis: Multi-Level Dynamical Low-Rank Approximations
- Master thesis: Dimension Reduction for Inverse Problems

Mini-symposium co-organiser, SciCADE 2024 – Singapore — 2024

- Co-organised the mini-symposium 'Dynamical Low-Rank Approximations: from theory to applications'
- Invited and coordinated leading researchers; managed scientific program

Summer school co-organiser, NUMRAD 2024 – Lausanne, Switzerland — 2024

- Identified and contacted speakers; secured funding including a European Mathematical Society grant
- Designed the website and handled communication with participants

Full Stack Junior Developer, RodanoTech – Geneva, Switzerland 2020

Internship at a clinical data management CRO; implemented full-stack features and internal software tools

Publications

A hybrid tau-leap scheme for simulating chemical kinetics with applications to parameter estimation 2024
T. Trigo Trindade, K. Zygalakis
(Royal Society Open Science)

Petrov–Galerkin Dynamical Low Rank Approximation: SUPG stabilisation of advection-dominated problems 2025
F. Nobile, ***T. Trigo Trindade***
(Computer Methods in Applied Mechanics and Engineering)

Error Estimates for SUPG-Stabilised Dynamical Low Rank Approximations 2025
F. Nobile, ***T. Trigo Trindade***
(ENUMATH Volume 2)

Dynamical Low-Rank Approximations for Kalman Filtering 2025
F. Nobile, ***T. Trigo Trindade***
(arXiv preprint)

Dynamical Low-Rank Ensemble Kalman filter for State/Parameter estimation 2026
F. Nobile, S. Riffaud, ***T. Trigo Trindade***
(arXiv preprint)

Discretisation-robust BUG schemes 2026
F. Nobile, ***T. Trigo Trindade***
((in preparation))

Skills

Programming: Python, Julia, C/C++; HPC workflows; MPI (academic projects); CUDA (coursework); JAX (supervision experience)

Numerical Methods: High-performance PDE solvers, sparse & dense linear algebra, Krylov methods, tensor decompositions, dynamical low-rank methods, stabilised finite element schemes

Tools: Git/GitLab, HPC job schedulers (SLURM), Python & Julia profilers (cProfile, BenchmarkTools)

Languages: French (mother tongue), German (mother tongue), English (proficient), Portuguese (basic)