Mohamed Fkirine

Postdoctoral Researcher, Systems Theory Research Group
Mathematics Research Centre, Tampere University, Finland

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Nationality: Moroccan
Born: 29 February 1996, Taroudant, Morocco
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Professional Summary

Experienced researcher in applied mathematics specializing in operator theory (in particular one-parameter semigroup theory), control theory of infinite-dimensional systems, and stochastic partial differential equations. Currently a postdoctoral researcher in the Systems Theory Research Group at the Mathematics Research Centre, Tampere University, Finland, under the supervision of Prof. Lassi Paunonen. I combine analytic and probabilistic methods to study well-posedness, stability, and controllability of stochastic and deterministic PDEs, and aim to further develop these directions in an academic position.

Professional Experience

Tampere University, Finland   2024–Present
Postdoctoral Researcher, Systems Theory Research Group

Supervisor   Prof. Lassi Paunonen

Education

Ibn Zohr University, Agadir, Morocco   2018–2023

Degree   Ph.D. in Applied Mathematics (awarded 21 January 2023)

Thesis   "Contribution to the Admissibility of a Class of Semilinear Stochastic Evolution Equations and Applications"

Supervisor Said Hadd

Ibn Zohr University, Agadir, Morocco   2016–2018

Degree   M.Sc. (applied mathematics), Degree with Honours (awarded in December 2018)

Thesis   "Admissibility and Observability of Semilinear Evolution Equations"

Supervisor Said Hadd

Ibn Zohr University, Agadir, Morocco   2013–2016

Degree   B.Sc. (applied mathematics), Degree with Honours (awarded in July 2016).

Research Interests

My research fields are

- Functional analysis and operator theory, in particular one-parameter semigroup theory
- Control theory of infinite-dimensional systems
- Stochastic analysis in infinite dimensions

I combine techniques from the above fields to study linear and nonlinear deterministic and stochastic PDE.

Publications

7. M. Fkirine, M. Kovács, E. Sikolya, "On the strong Feller property of the heat equation on quantum graphs with Kirchhoff noise", Semigroup Forum, 112, 48–78, 2026.

6. M. Fkirine, S. Hadd and A. Rhandi, "Impact of Mixed Boundary Conditions on Stochastic Equations with Noise at the Boundary", Nonlinear Differential Equations and Applications NoDEA, 32(2), pp. 30, 2025.

5. M. Fkirine, S. Hadd and A. Rhandi, "On evolution equations with white-noise boundary conditions", Journal of Mathematical Analysis and Applications, 535(1), pp. 128087, 2025.

4. Y. El Gantouh, M. Fkirine and Y. Simpore, "Controllability under positivity constraints of a size-structured population model with delayed birth process", Mathematical Methods in the Applied Sciences, 47(6), pp. 4679–4696, 2024.

3. M. Fkirine and S. Hadd, "Solving stochastic equations with unbounded nonlinear perturbations", Stochastics, 96(3), pp. 1143–1168, 2023.

2. M. Fkirine and S. Hadd, "The well-posedness of a parabolic non-autonomous semilinear equation", IFAC-PapersOnLine, 55(12), pp. 198–201, 2022.

1. M. Fkirine and S. Hadd, "On nonlinear Miyadera-Voigt perturbations", Archiv der Mathematik, 119(2), pp. 179–188, 2022.

Preprints

2. M. Fkirine, L. Paunonen, "Polynomial stability of wind turbine tower models", arXiv preprint arXiv:2503.22432, 2025.

1. T. Tokola, M. Fkirine, L. Paunonen, "On excitable control of stable infinite-dimensional systems", submitted, 2025.

Conference talks

15. Polynomial stability of wind turbine tower models, *International workshop on operator theory and applications (IWOTA) 2025*, Twente, Netherlands, July 17, 2025.

14. On evolution equations with white-noise boundary conditions, *Stochastic Sauna, invited by: Jonas Tölle*, Helsinki, Finland, December 20, 2024.

13. Stochastic admissibility and Generator perturbations for stochastic Cauchy problems, *International workshop on operator theory and applications (IWOTA) 2024*, Canterbury, United Kingdom, August 14, 2024.

12. Generator perturbations for stochastic Cauchy problems, *Agent-Forum*, Jyväskylä, Finland, May 15, 2024.

11. Generator perturbations for stochastic Cauchy problems, *Action CA18232 – Mathematical Models for Interacting Dynamics on Networks*, Braga, Portugal, February 06, 2024.

10. An introduction to control theory in infinite dimensions, *Seminar at the Institute of Mathematics, Eötvös Loránd University*, Budapest, Hungary, October 02, 2023.

9. Stochastic PDEs on metric graphs, *Networking in Applied Network Theory, a research project coordinated by Dr. Eszter Sikolya*, Bedlewo, Poland, February 24, 2023.

8. Staffans-Weiss perturbations for linear stochastic Cauchy problems in Hilbert spaces, *The 12th Euro-Maghrebian Workshop on Evolution Equations and Cost WG1-meeting*, Agadir, Morocco, September 15, 2022.

7. The Gearhart–Greiner–Prüss theorem, *25th Internet Seminar on Spectral Theory for Operators and Semigroups*, Agropoli, Italy, June 22, 2022.

6. The well-posedness of a parabolic non-autonomous semilinear equation, *The 14th IFAC on Adaptive & Learning Control Systems*, Casablanca, Morocco, June 29, 2022.

5. Well-posedness of stochastic evolution equations under nonlinear Miyadera-Voigt perturbations, *ABS CIMPA School 2021 of Finance & Operation Research*, Benguerir, Morocco, November 1, 2021.

4. Well-posedness of stochastic evolution equations under nonlinear Miyadera-Voigt perturbations, *4th National Meeting of Analysis Mediterranean Mathematical Meeting : First Edition*, Nador, Morocco, May 20, 2021.

3. Well-posedness of stochastic evolution equations under nonlinear Miyadera-Voigt perturbations, *Third International Conference on Research in Applied Mathematics and Computer Science (ICRAMCS'2021)*, Casablanca, Morocco, March 27, 2021.

2. A new approach to solve semilinear stochastic evolution equations in Hilbert spaces, *TACSI'20 Day of Analysis Theory and Control of Infinite Systems*, Marrakech, Morocco, July 20, 2020.

1. A non-standard semilinear stochastic evolution equation, *1st edition of Day Doctoral by Laboratory of Applied Mathematics and Applications*, Agadir, Morocco, December 5, 2019.

Courses & Training Schools

4. Positive semigroups, Budapest, Hungary, September 04–08, 2023.

3. Networking in Applied Network Theory, Bedlewo, Poland, February 19–25, 2023.

2. 25th Internet Seminar on Spectral Theory for Operators and Semigroups, Agropoli, Italy, June 20–24, 2022.

1. ABS CIMPA School 2021 of Finance & Operation Research, Benguerir, Morocco, November 1–5, 2021.

Research Collaborators

A. Rhandi (University of Salerno)
S. Hadd (Ibn Zohr University)
E. Sikolya (Eötvös Loránd University)
M. Kovács (Chalmers University)
Y. El Gantouh (Zhejiang Normal University)
Y. Simpore (Université Joseph Ki-Zerbo)
L. Paunonen (Tampere University)
D. Seifert (Newcastle University)

Research stays

03 Nov 2024 – 07 Dec 2024   Newcastle University, United Kingdom
Five-week research visit
Invited by: Prof. Dr. David Seifert
Supported by: Research Council of Finland

09 Sep 2023 – 09 Nov 2023   Eötvös Loránd University, Hungary
One-month research visit
Invited by: Prof. Dr. Eszter Sikolya
Supported by: COST Action 18232

01 Jun 2023 – 30 Jun 2023   Eötvös Loránd University, Hungary
One-month research visit
Invited by: Prof. Dr. Eszter Sikolya
Supported by: COST Action 18232

29 Sep 2022 – 28 Oct 2022   Università degli Studi di Salerno, Italy
One-month research visit
Invited by: Prof. Dr. Abdelaziz Rhandi
Supported by: COST Action 18232

13 Jun 2022 – 25 Jun 2022   Università degli Studi di Salerno, Italy
Two-week research visit
Invited by: Prof. Dr. Abdelaziz Rhandi.

Research Funding & Grants

- Excellence Scholarship from the Centre National pour la Recherche Scientifique et Technique (CNRST) for the project *"Contribution to the Admissibility of a Class of Semilinear Stochastic Evolution Equations and Applications"* (01.01.2019—01.01.2022).
  Total funding: 108,000 MAD.

- COST Action Grant: *Mathematical Models for Interacting Dynamics on Networks.*
  Travel grants awarded:
    - 2023: €3,390
    - 2023: €2,200
    - 2022: €1,750

Teaching Experience

2024–2025   Teaching Assistant, Discrete Mathematics, Tampere University, Finland.

2021–2022   Teaching Assistant, Mathematics (SV1/STU1), Faculty of Sciences, Agadir, Morocco.

2020–2021   Teaching Assistant, Mathematics (SV1/STU1), Faculty of Sciences, Agadir, Morocco.

Supervision of Doctoral Students

Tuulia Tokola (2025–Present)

- Main Supervisor: Prof. Lassi Paunonen
- Topic: *Neuromorphic Control of Linear Partial Differential Equations*

Organization of Scientific Events

Member of the organizing committee of the "12th Euro-Maghrebian Workshop on Evolution Equations and COST WG1 Meeting", Agadir, Morocco (12–16 Sep 2022).

Languages

- Arabic — native
- English — very good
- French — very good

References

Prof. Dr. Said Hadd
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Computational Mathematics
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