Karine Mauffrey

Post-doctoral fellow at Inria

Centre Inria Saclay - Île-de-France
Bâtiment Alan Turing
1 rue Honoré d'Estienne d'Orves
91120 Palaiseau
France
✉ *karine.mauffrey@inria.fr*
m3disim.saclay.inria.fr/m3disim-staff/karine-mauffrey/
Born on 24-09-1984, French nationality

Curriculum Vitae

Education

2008–2012 **PhD Thesis in Mathematics and Applications**, *Laboratoire de Mathématiques de Besançon, Université de Franche-Comté, Besançon, France*.
- Advisors : Farid Ammar Khodja (Associate professor, Besançon, France) and Arnaud Münch (Professor, Clermont-Ferrand, France).
- Subject : **"Controllability of systems governed by partial differential equations (PDEs)"**.
- Defended on 23-10-2012. Jury: Jérôme Le Rousseau (president), Jean-Michel Coron & Marius Tucsnak (reviewers), Assia Benabdallah, Louis Jeanjean & Vilmos Komornik (examiners), Farid Ammar Khodja & Arnaud Münch (advisors).

2007–2008 **Masters in Mathematics and Applications (2nd year)**, *Université de Franche-Comté, Besançon*. Rank: 2/15.
Dissertation entitled "Ingham type inequalities and applications to control theory", advisors: Farid Ammar Khodja & Arnaud Münch.

2006–2007 **Training for the competitive recruitment procedures for public sector teaching posts in Mathematics**.
- CAPES de Mathématiques (Gives access to teaching positions in secondary schools), obtained in 2007, rank: 6th (out of 952 successful candidates).
- Agrégation de Mathématiques, obtained in 2008, rank: 66th (out of 252 successful candidates).

2005–2006 **Masters in Mathematics and Applications (1st year)**, *Université de Franche-Comté, Besançon*. Rank: 1/28.

2004–2005 **Licence de Mathématiques et Applications (3-year university degree in Mathematics)**, *Université de Franche-Comté, Besançon*. Rank: 4/104.

2002–2004 **Classes Préparatoires aux Grandes Écoles MPSI-MP (university-level preparation for the competitive entrance exams to French engineering schools)**, *Lycée Victor Hugo, Besançon*.

Professional experiences

sept. 2012– **Post-doctoral fellow**, *Inria project-team* M∃DISIM *(Mathematical and Mechanical Modeling with Data Interaction in SImulations for Medicine), part of the Saclay-Ile-de-France Research Center, Palaiseau*.
Subject : **"Formulation and analysis of novel observers for evolution PDEs"**.

2008–2012 **PhD Thesis in Mathematics and Applications**, *Laboratoire de Mathématiques de Besançon, Université de Franche-Comté, Besançon*.

2011–2012 **ATER (Teaching and research assistant in Mathematics) at part-time**, *École Nationale Supérieure de Mécanique et des Microtechniques-ENSMM (National School of Mechanical and Microtechnical Engineering), Besançon*.

2008–2011 **Monitorat (Teaching assistant in Mathematics)**, *ENSMM, Besançon*.

Teaching activities

2011–2012 **97 hrs.**, *at ENSMM*, as part of my functions of ATER.
- Courses (6 hrs.) and tuitions (78 hrs.) for 1st year students, in distributions theory and convolution of distributions.
- In charge of "stages d'immersion en entreprise" for 2nd year students at ENSMM.

2008–2011 **160 hrs.**, *at ENSMM*, as part of my functions of teaching assistant.
Tuitions for 1st year students in Fourier and Laplace transforms, distributions theory and convolution of distributions

2009–2010 **Oral examinations (52 hrs.),** Classes Préparatoires aux Grandes Écoles BCPST 1 (university-level preparation for the competitive entrance exams to French engineering schools, French veterinary schools and French schools of agronomy), *Lycée Victor Hugo, Besançon*.

2005–2006 **Tutored 1st year students in Mathematics**, *Université de Franche-Comté, Besançon*.

Research activities

Research themes

Controllability of systems of coupled PDEs (with a small number of controls).
- *Keywords:* controllability, observability, hyperbolic and parabolic systems, Ingham inequalities, Carleman inequalities, numerical approximation.
- Research projects:
  - Member of a project of the ANR Blanc 2013 program "SIMI 1 - Mathématiques et interactions" submitted by Jérôme Le Rousseau.
  - Since 2009: member of the GDRE CONEDP (CONtrôle des Équations aux Dérivées Partielles).
  - 2008–2011: member of the ANR Young-researcher project CoNum, "Contrôle Numérique, applications à la biologie" (project ANR-07-JCJC-0139-01).

Models of observers for PDEs.
- *Keywords:* observers, optimal filtering, Riccati equation in infinite dimension, parabolic equations, stability.

Publications in international peer-reviewed journals

K. Mauffrey, *On the null controllability of a 3×3 parabolic system with non-constant coefficients by one or two control forces,* J. Math. Pures Appl. (9), Vol. 99, No. 2, pp. 187–210, 2013.

F. Ammar Khodja, K. Mauffrey, A. Münch, *Exact boundary controllability of a system of mixed order with essential spectrum,* SIAM J. Control Optim., Vol. 49, No. 4, pp. 1857–1879, 2011.

Skills

Languages

English: very good level (B2 level given by the Centre de Linguistique Appliquée de l'Université de Franche-Comté, an expert center in languages).

Spanish: a few words.

Computer skills

Operating systems: Linux, Mac, Windows.

Office softwares: Latex, word processors, presentation softwares...

Scientific computation softwares: Maple, Matlab, Scilab, FreeFem++.

Synergistic activities

2011–2012 **In charge of the seminar for Ph D students of the Laboratoire de Mathématiques de Besançon**.

Organization of scientific events

June 2010 **Co-organizer of the "Workshop on Control and Inverse Problems"**, *Laboratoire de Mathématiques de Besançon*.

Oct. 2009 **Co-organizer of one of the thematic days "Journées Metz-Nancy-Besançon-Strasbourg de Contrôle des EDP"**, *Laboratoire de Mathématiques de Besançon*.