

Lucie Baudouin

Nationality: French

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CNRS Research Associate in the team MAC of LAAS since 2006.

Education

- 2014 French « **Habilitation à Diriger des Recherches** » from Université Toulouse 3 Paul Sabatier, defended at LAAS-CNRS in june 2014 :
« *Inverse problems and robust control of some partial differential equations.* »
- 2005-2006 **Postdoc** at the LAAS-CNRS, Methods and Algorithms in Control (MAC) group :
« *Analysis and robust control of linear intelligent materials.* »
- 2001-2004 **PhD Thesis** in mathematics, under the supervision of J.-P. Puel at the University of Versailles, defended in november 2004 :
« *Contributions to the study of Schrödinger equation : inverse problem in bounded domain and bilinear optimal control of an Hartree-Fock equation.* »
- 2000-2001 **Master's** degree in numerical analysis, University Pierre & Marie Curie, Paris VI.
- 1996-2000 4-years university degree in mathematics. University of Versailles Saint Quentin.

Teaching Activities

- 2016- ... Doctoral training « *Ethics in Research and Scientific Integrity.* » (in French, [cel-01452867](#))
- 2007- ... Some courses of mathematics and automatics at the engineer schools [INSA](#)-Toulouse (Institut National des Sciences Appliquées) and [ISAE](#) (Institut Supérieur de l'Aéronautique et de l'Espace) ; around 40h per year.
- 2001-2005 Teaching of mathematics in 2-years university degrees at the University of Versailles ; around 70h per year.

Collective responsibilities:

- Elected member of the « comité national de la recherche scientifique » since 2016, [scientific secretary of section 7](#) (Information sciences: Image and signal processing, computer graphics and vision, embedded systems and systems on chips, robotics, automatic control, human machine interaction, speech and language processing) ;
- Deputy leader of the Department [Decision and Optimisation](#) of the LAAS since 2016.
- Member of the [leading council](#) of the doctoral school « systems » (ED 309), Univ. Toulouse 2015-2017 ;
- Member of the IFAC Technical Committee on Distributed Parameter Systems (2012-...)
- Elected member of the laboratory Council of the LAAS-CNRS (2008-2010)
- Member of the local organising committee of several conferences and workshops :
 - [IFAC World Congress](#), Toulouse, july 2017 ;
 - *Control of Fluid-Structure Systems and Inverse Problems* workshop, Toulouse, June 2012 ;
 - IFAC workshop [CDPS09](#) : « Control of Distributed Parameter Systems », Toulouse, July 2009, webmaster and co-editor of the BOA.
- Member of « comité de sélections » for the recruitment of associate researcher at the universities of Compiègne (2009) and Marseille (2011, 2014).

Research Themes and Publications

Themes

- Stability and Robust Control of Partial Differential Equations (transport, plate, wave, heat).
- Inverse Problems convergence and reconstruction issues in PDEs (wave, Schrödinger, KS, KdV,...).

Publications in International Journals

- *Convergent algorithm based on Carleman estimates for the recovery of a potential in the wave equation*, with M. de Buhan & S. Ervedoza, SIAM J. on Num. Analysis, 55 (2017), no. 4, 1578-1613. [hal-01352772](#)
- *Inverse problem on a tree-shaped network: unified approach for uniqueness*, with M. Yamamoto. Applicable Analysis, 94, no. 11, (2015) 2370-2395. [hal-01081783](#)
- *Stability of an inverse problem for the discrete wave equation and convergence results*, with S. Ervedoza & A. Osses. J. de Math. Pures et Appl. (9) 103, no. 6, (2015) 1475-1522. [hal-00874565](#)
- *On the determination of the principal coefficient from boundary measurements in a KdV equation*, with E. Cerpa, E. Crépeau & A. Mercado. J. of Inv. & Ill-posed prob, 22, no. 6, (2013) 819-845. [hal-00765919](#)
- *Global Carleman estimates for waves and applications*, with M. de Buhan & S. Ervedoza. Comm. in Partial Diff. Eq., Vol. 38, no. 5, (2013) 823-859. [hal-00633562](#)
- *Convergence of an inverse problem for discrete wave equations*, with S. Ervedoza. SIAM J. on Control Optim. 51-1 (2013) 556-598. [hal-00602335](#)
- *Lipschitz stability in an inverse problem for the Kuramoto-Sivashinsky equation*, with E. Cerpa, E. Crépeau & A. Mercado. Appli. Analysis, Vol. 92, no.10 (2013) 2084-2102. [hal-00510506](#)
- *Active vibration control of a fluid/plate system using a pole placement controller*, B. Robu, LB, C. Prieur. International Journal of Control, Vol 85, no.6 (2012) 684-694. [hal-00584586](#)
- *Simultaneous H^∞ vibration control of fluid/plate system via reduced-order controller*, B. Robu, LB, C. Prieur & D. Arzelier. IEEE Trans. Control Sys. Tech, 20, no.3 (2012) 700-711. [hal-00584343](#)
- *Contrôle actif des vibrations dans un système couplé fluide/structure*, B. Robu, LB & C. Prieur. J. Européen des Systèmes Automatisés, 45, no.7-10 (2012) 495-511. [hal-00584310](#)
- *Global Carleman estimate on a network for the wave equation and application to an inverse problem*, with E. Crépeau & J. Valein. Math. Control and Related Fields, Vol 1, Issue 3, (2011), 307-330. [hal-00576296](#)
- *Analysis of the Toolkit method for the time dependant Schrödinger equation*, with J. Salomon & G. Turinici. Journal on Scientific Computing, Vol 49, no. 2 (2011) 111-136. [hal-00403798](#)
- *An inverse problem for Schrödinger equations with discontinuous main coefficient*, with A. Mercado. Applicable Analysis 87, no. 10-11 (2008) 1145-1165. [hal-00271954](#)
- *Robust control of a bimorph mirror for adaptive optics system*, LB, C. Prieur, F. Guignard & D. Arzelier. Applied Optics. 47 (2008), no. 20, 3637-3645. [hal-00271968](#)
- *Constructive solutions of a bilinear control problem for a Schrödinger equation*, with J. Salomon. Systems and Control Letters, 57 (2008), no. 6, 453-464. [hal-00271940](#)
- *A global Carleman estimate in a transmission wave equation and application to a one-measurement inverse problem*, with A. Mercado & A. Osses. Inverse Problems 23 no 1 (2007) 257-278. [hal-00271925](#)
- *A bilinear optimal control problem applied to a time dependent Hartree-Fock equation coupled with classical nuclear dynamics*. Portugaliae Mathematica (N.S.) 63 no. 3 (2006) 293-325.
- *Existence and regularity of the solution of a time dependent Hartree-Fock equation coupled with a classical nuclear dynamics*. Revista Matemática Complutense, 18 (2005), no. 2, 285-314.
- *Regularity for a Schrodinger equation with singular potentials and application to bilinear optimal control*, with O. Kavian & J.-P. Puel. Journal of Differential Equations, 216 (2005), no.1, 188-222.
- *Uniqueness and stability in an inverse problem for the Schrodinger equation*, with J.-P. Puel. Inverse Problems 18 (2002), 1537-1554. [hal-00143868](#)

Proceedings

- *Refined exponential stability analysis of a coupled system*, M. Safi, LB & A. Seuret, IFAC world congress, july 9-14, 2017, Toulouse. [hal-01496136](#)
- *Lyapunov stability analysis of a linear system coupled to a heat equation*, LB, A. Seuret, F. Gouaibaut & M. Dattas, IFAC world congress, july 9-14, 2017, Toulouse. [hal-01496115](#)
- *Stability analysis of a system coupled to a transport equation using integral inequalities*, LB, M. Safi & A. Seuret, IFAC workshop on Control of sys. gov. by Partial Diff. Eq., Bertinoro, Italy (CPDE 2016). [hal-01310306](#)
- *Robust measurement feedback control of an inclined cable*, LB, S. Neild, A. Rondepierre & D. Wagg. IFAC workshop on Control of sys. gov. by Partial Diff. Eq., Paris, France (CPDE 2013). [hal-00784727](#)
- *H^∞ -control with state feedback of an inclined cable*, LB, S. Neild & D. Wagg. European Control Conference 2013, Zurich, Suisse (ECC 2013). [hal-00822702](#)
- *Simultaneous H infinity vibration control of fluid/plate system via reduced-order controller*, B. Robu, V. Budinger, L. B. C. Prieur & D. Arzelier. Conf. on Decision and Control, Atlanta (CDC 2010). [hal-00556927](#)
- *A controlled distributed parameter model for a fluid-flexible structure system: numerical simulations and experiment validations*, B. Robu, LB & C. Prieur. Conf. on Decision and Control, Shanghai (CDC 2009).
- *Control of adaptive optics system: an H -infinite approach*, LB, C. Prieur, F. Guignard & D. Arzelier. IFAC world congress (2008).
- *Robust control of a bimorph mirror for adaptive optics system*, LB, C. Prieur & D. Arzelier. International Symposium on Mathematical Theory of Networks and Systems (MTNS 2006).

Research Activities

Collaborative Framework

- Member of the MAC team from Department Decision & Optimisation of the LAAS-CNRS since 2005.
- ANR SCIDiS (Stability and Control of Infinite Dimensional Systems), coord. A. Seuret (MAC, LAAS-CNRS) ; 2015-2019.
- Member of the European GDR [CONEDP](#) (Control of partial differential equations), coord. F. Alabau.
- Visiting Fellow at the Department of Mechanical Engineering of Bristol University, 2012-2014.
- Math Amsud [COSIP](#) (Control Systems and Identification Problems), coord. C. Prieur (GIPSA-lab, France), F. Araruna (Brazil), E. Cerpa (Chile) ; 2014-2015.
- Université de Toulouse, projet PICAN (Inverse problems and numerical approximations), coord. S. Ervedoza (CNRS and IMT) ; 2011-2012.
- Project CNRS-JSPS (Unified studies on control theory and inverse problems); coord. J. Le Rousseau ; 2010-2012.
- ANR CISIFS (Contrôle et identification pour les systèmes d'interaction fluide-structure) coord. L. Rosier (IECN Nancy) ; 2010-2013.
- Math Amsud [CIP-PDE](#) (Controllability and inverse problems in partial differential equations), coord J.-M. Coron (LJLL et IUF, France), G. Menzala (Brazil), A. Osses (Chile) ; 2009-2011.
- PICS (Manipulation and identification of quantic phenomenon), coord. G. Turinici (CEREMADE) and H. Rabitz (USA) ; 2007-2011.

Students

- Co-advisor, with Alexandre Seuret, of the PhD of Mohammed Safi, started in september 2015, on '*Stability and control of coupled finite/infinite dimensional systems*'.
- Co-advisor, with Christophe Prieur, of Bogdan Robu (assistant professor at Univ. of Grenoble and GIPSA-lab), PhD defended in december 2010, on '*Active vibration control of a fluid/plate system*'.
- Advisor of several students in Masters degree, on subjects like '*Modeling of a fluid/plate system*' or '*Robust control in adaptive optics*'.

Conferences and invitations (from 2009)

- November 2018 : Conference at the workshop *Analyse des EDP*, **Paris, France**.
- January 2018 : Two-weeks invitation at Univ. F. Santa Maria and Univ. de Chile, **Chili**.
- August 2017 : Conference at the workshop on *PDEs, optimal design and numerics*, **Benasque, Spain**
- July 2017 : Talk at IFAC World Congress, **Toulouse, France**.
- Nov. 2016 : Seminar at the LAAS – IMT day, **Toulouse, France**.
- June 2016 : Talk at CPDE IFAC workshop (Control of sys. modeled by PDEs), **Bertinoro, Italie**.
- January 2016 : Two weeks invitation at the F. Santa Maria Univ. by A. Mercado, **Valparaiso, Chile**.
- August 2014 : Talk at *Inverse Problems, Theory to Applications* conference, **Bristol, United Kingdom**.
- July 2014 : Seminar at the *Control Group*, Univ. of Oxford, **United Kingdom**.
- April 2014 : Talk at the conference *Control of PDEs*, CNAM, **Paris, France**.
- September 2013 : Talk at the CPDE (IFAC workshop on control of sys. modeled by PDE), **Paris, France**.
- July 2013 : Talk at the European Control Conference, **Zurich, Swiss**.
- July 2013 : Talk at the *Applied Inverse Problems Conference*, **Daejeon, South Korea**.
- May 2013 : Seminar at LAGEP, **Lyon, France**.
- April 2013 : Seminar at *POEMS*, ENSTA, **Saclay, France**.
- June 2012 : Seminar at LMAM, **Metz, France**
- January 2012 : Seminar at the Workshop on Inverse Problems and PDE control, **Santiago, Chili**.
- November 2011 : Seminar at the European GDR ConEDP's Conference, **Marseille, France**.
- October 2011 : Seminar at the *Institut de Mathématique de Toulouse*, **France**.
- August 2011: Conference at the workshop on *PDEs, optimal design and numerics*, **Benasque, Spain**.
- January 2011: Seminar at the *Graduate school of mathematical science*, **Tokyo, Japan**.
- November 2010 : Conference at the workshop on *Control of Dispersive Equations*, **Paris, France**.
- June 2010: Conference at the workshop on *Control and Inverse Problem*, **Besançon, France**.
- March 2010: Talk at the *Groupe de travail problèmes inverses et contrôle* of LATP, **Marseille, France**.
- January 2010: Conference at the workshop on Inverse Problems and Applications, **Valparaiso, Chile**.
- February 2009: Talk at the *Groupe de travail Contrôle* of Laboratoire J.-L. Lions, **Paris, France**.
- January 2009 : One-week invitation at the Graduate School of Mathematical Science of the University of **Tokyo** by M. Yamamoto.
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