Charlotte Rodriguez

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Interests

- Machine Learning
- Geometrically exact beam models (i.e., nonlinear beam models for flexible structures)
- Modelling, Control, Stabilization
- Numerics, Scientific Computing.

Contact and personal information

- Email: `rdz.charlotte (at) gmail.com`
- Born on the 26th of May, 1994 (27 years old)
- Citizenship: French.

Education

PhD in Applied Mathematics 07/2018 – 12/2021
Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany

- Thesis: Control and stabilization of geometrically exact beams.
- Supervisor: Pr. Günter Leugering.
- Highest Honors.

M.Sc in Applied Mathematics 09/2016 – 06/2018
Université de Bordeaux, France

- Analysis, Partial Differential Equations, Probability.
- Highest Honors.
- Master's thesis: Model order reduction via proper orthogonal decomposition and balanced truncation (supervisor: Pr. Marius Tucsnak).

B.Sc. in Applied Mathematics & Computer Science 09/2013 – 07/2016
Université de Bordeaux, France

- Minor in Cognitive Sciences.
- Highest Honors. Ranked 1st.

Professional experience

FAU Erlangen-Nürnberg 01/07/2018 – 31/08/2021
Research assistant, Erlangen, Germany

- I was Early Stage Researcher within the project "Control of Flexible Structures and Fluid-Structure Interactions - ConFlex" funded by the H2020 Marie Sklodowska Curie ITN programme.

Imperial College London 01/10/2019 – 31/11/2019
Research intern, United Kingdom

- Visit at the Department of Aeronautics (Load Control and Aeroelastics Lab) to work on geometrically exact beams from the perspective of aeronautics. Our collaboration resulted in the publication [4] below.
- Supervisors: Pr. Rafael Palacios and Dr. Andrew Wynn.

DeustoTech, University of Deusto 01/10/2018 – 31/11/2018
Research intern, Bilbao, Spain

- Visit at the Chair of Computational Mathematics led by Pr. Enrique Zuazua, to work on geometrically exact beam models and their links with first-order hyperbolic systems.
- Supervisor: Pr. Enrique Zuazua.

CNRS & Institut de Mathématiques de Bordeaux 01/02/2018 – 22/06/2018
Research intern, Bordeaux, France

- As part of my master thesis, research on "Model order reduction via Proper Orthogonal Decomposition (POD) and Balanced truncation"
- Supervisor: Pr. Marius Tucsnak.

Other

Machine learning Coursera certificate
Online, 02/2022

- Online non-credit course authorized by Stanford University.
- Credential ID: BSPG56QR9LNL

École 42
Paris, France, 26/08/2014 – 16/09/2014

- I attended the so-called "Piscine d'été" of the Computer Science school "École 42". This was a one month-long training in C programming, and simultaneously a test to be admitted to this school.
- Result : Admitted.

Skills

</> Programming

- Proficient in `Python`:
  - OOP (multi-agent system, complex numbers library, intelligent vacuum cleaner),
  - simulation of partial differential equations (PDE) using finite differences and finite elements methods,
  - board games.
- Proficient in `Matlab`:
  - simulation of PDEs using finite differences and finite elements methods,
  - GUI handling EEG signals,
  - model reduction,
  - image processing using wavelet transformations.
- Basic knowledge in `C`.
- Basic knowledge in dynamic website design: `HTML, CSS, PHP, SQL`.

CNRS & Institut de Mathématiques de Bordeaux 02/05/2017 – 27/06/2017
Research intern, *Bordeaux, France*

- Research on Control Theory.
- Supervisor: Pr. Marius Tucsnak.
- Help in the organisation of the international workshop Control of Distributed Parameter Systems 2017.

Université de Bordeaux 01/06/2016 – 15/07/2016
Research intern, *Bordeaux, France*

- Introduction to functional analysis.
- Supervisor : Pr. Arnaud Ducrot.

INRIA & Université de Bordeaux 03/06/2015 - 28/07/2015
Research intern, *Bordeaux, France*

- Development of a graphical user interface handling EEG signals in `Matlab` (https://goo.gl/F4vBEx), in a team of two.
- Supervisor : Pr. Pierrick Legrand.

Université de Bordeaux 09/2014 – 06/2016
Mathematics tutor for first-year BSc students., *Bordeaux, France*

Linux
Windows
MacOS
LaTeX
Git
Microsoft Office.

Languages

- English: *fluent*
- Spanish: *basic*
- German: *beginner*
- French: *native.*

Scientific publications

[6] G. Leugering, C. Rodriguez, Y. Wang, "Exact controllability of networks of elastic strings springs and masses", in preparation.

[5] C. Rodriguez, "Control and stabilization of geometrically exact beams", PhD Thesis, *Friedrich-Alexander-Universität Erlangen-Nürnberg*, **2022**, urn:nbn:de:bvb:29-opus4-180496, arXiv:2202.07531

[4] C. Rodriguez, "Networks of geometrically exact beams: well-posedness and stabilization", *Mathematical Control and Related Fields* 12 (1), 49–80, **2022**, doi:10.3934/mcrf.2021002, arXiv:2009.07183

[3] M. Artola, C. Rodriguez, A. Wynn, R. Palacios, G. Leugering, "Optimisation of Region of Attraction Estimates for the Exponential Stabilisation of the Intrinsic Geometrically Exact Beam Model", *60th IEEE Conference on Decision and Control (CDC)*, pp. 6043–6048, **2021**, doi: 10.1109/CDC45484.2021.9683680, arXiv:2110.06002

[2] G. Leugering, C. Rodriguez, Y. Wang, "Nodal profile control for networks of geometrically exact beams", *Journal de Mathématiques Pures et Appliquées* 155, 111–139, **2021**, doi:10.1016/j.matpur.2021.07.007, arXiv:2103.13064

[1] C. Rodriguez, G. Leugering, "Boundary feedback stabilization for the intrinsic geometrically exact beam model", *SIAM Journal on Control and Optimization* 58 (6), 3533–3558, **2020**, doi:10.1137/20M1340010, arXiv:1912.02543

Scientific presentations

at Workshops:

- 1/10/2021, *Mini-Workshop on Recent Advances in Analysis and Control*, Chair Dynamics, Control and Numerics (DCN), FAU Erlangen-Nürnberg, Germany, virtual.
- 4/08/2021, *4th workshop of the ConFlex consortium*, Lacanau, France.
- 12/10/2020, *Mini-Workshop on Hyperbolic Problems*, Chair Dynamics, Control and Numerics (DCN), FAU Erlangen-Nürnberg, Germany.
- 30/06/2020, *3rd workshop of the ConFlex consortium*, Imperial College London, UK, virtual.
- 28/08/2019, *8th Workshop on PDE, Optimal Design and Numerics*, Centro de Ciencias "Pedro Pascual", Benasque, Spain.
- 20/02/2019, *2nd workshop of the ConFlex consortium*, Bilbao, Spain.

at Seminars:

- 13/02/2020, *IIT Delhi India.*
- 3/10/2019, *Load Control and Aeroelastics Lab, Imperial College London, UK.*
- 7/02/2019, *IIT Delhi, India.*
- 22/10/2018, *DeustoTech, Bilbao, Spain.*