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Address:

Via San Pietro 1, 35010
Vigonza (PD) - Italy

Languages:

Italian (C2)
English (C1, IELTS 7.5)

Computer softwares:

LaTeX
Matlab
Wolfram Mathematica
Python
Microsoft Office tools

Mattia Sensi, Ph.D.

Postdoctoral researcher at Inria

About Me

My research interests are primarily mathematical biology and dynamical systems, and the main topic of my research at the moment is mathematical models of neural activity. My major expertise is the analysis of ODE systems evolving on multiple time scale, and mathematical epidemiology. I have worked on the analysis of PDE systems and on models of epidemics on networks. I am an advanced user of Matlab and LaTeX, and a competent user of Wolfram Mathematica and Python.

Research experience

- **Postdoctoral researcher in Mathematics**

  MathNeuro, Inria Sophia Antipolis, Biot, France, December 2021 – present.
  Postdoctoral researcher in the group of Prof. Mathieu Desroches.

- **Postdoctoral researcher in Mathematics**

  NAS, TUDelft, Delft, The Netherlands, March 2021 – November 2021.
  Postdoctoral researcher in the project "Epidemics over Human Contact Graphs", in the group of Prof. Piet Van Mieghem.

Education

- **Ph.D. in Mathematics, *cum laude***

  Università degli Studi di Trento, Trento, Italy, 2017-2021.
  Title of the thesis: *"A Geometric Singular Perturbation approach to epidemic compartmental models"*, under the supervision of Prof. Andrea Pugliese.

- **Master's Degree in Mathematics**

  Universiteit van Amsterdam, Amsterdam, The Netherlands, 2015–2017.
  Title of the thesis: *"Homoclinic vegetation stripes in a Klausmeier-Gray-Scott model"*, under the supervision of Prof. Dr. Arjen Doelman.

- **Bachelor's Degree in Mathematics**

  Università degli Studi di Padova, Padova, Italy, 2011–2014.
  Title of the thesis: *"Portfolio optimization for quadratic utility function with partial information"*, under the supervision of Prof. Wolfgang J. Runggaldier.

Articles

- **H. Jardón-Kojakhmetov, C. Kuehn, A. Pugliese and M. Sensi**. *A geometric analysis of the SIR, SIRS and SIRWS epidemiological models*. Nonlinear Analysis: Real World Applications, Volume 58, April 2021, 103220
- **H. Jardón-Kojakhmetov, C. Kuehn, A. Pugliese and M. Sensi**. *A geometric analysis of the SIRS epidemiological model on a homogeneous network*. Journal of Mathematical Biology 83, 37 (2021)
- **T. Lorenzi, A. Pugliese, M. Sensi and A. Zardini**. *Evolutionary dynamics in an SI epidemic model with phenotype-structured susceptible compartment*. Journal of Mathematical Biology 83, 72 (2021)
- **S. Ottaviano, M. Sensi and S. Sottile**. *Global stability of SAIRS epidemic models*. Nonlinear Analysis: Real World Applications, Volume 65, June 2022, 103501
- **B. Chang, L. Yang, M. Sensi, M. A. Achterber, F. Wang, M. Rinaldi and P. Van Mieghem**. *Markov Modulated Process to model human mobility*. Complex Networks & Their Applications X. Studies in Computational Intelligence, vol 1015, Springer
- **N. Cangiotti and M. Sensi**. *A geometric characterization of VES and Kadiyala-type production functions*. Filomat, Volume 35, No 5 (2021)
- **N. Cangiotti and M. Sensi**. *Notes on a conformal characterization of 2-dimensional Lorentzian manifolds with constant Ricci scalar curvature*. U.P.B. Sci. Bull., Series A, Vol. 83, Iss. 2, 2021

Preprints

- **S. Ottaviano, M. Sensi and S. Sottile**. *Global stability of multi-group SAIRS epidemic models*. Preprint on arXiv
- **S. Sottile, O. Kahramanogullari and M. Sensi**. *How network properties and epidemic parameters influence stochastic SIR dynamics on scale-free random networks*. Preprint on arXiv
- **M. Aguiar, B. Kooi, A. Pugliese, M. Sensi and N. Stollenwerk**. *Time scale separation in the vector borne disease model SIRUV via center manifold analysis*. Preprint on medRxiv
- **N. Cangiotti and M. Sensi**. *Exact solutions for a Solow-Swan model with non-constant returns to scale*. Preprint on arXiv
- **N. Cangiotti, M. Capolli and M. Sensi**. *A Generalization of Lanchester's Model of Warfare*. Preprint on arXiv

Teaching experience

- **At Università degli Studi di Trento:**

  Assistant teacher Prof. Alberto Valli's course *Analisi 1*, for first year students of Bachelor's Degree in Civil, Environmental and Mechanical Engineering, September 2018 – February 2019, September 2020 – February 2021

  Tutor for Prof. Andrea Pugliese's course *Probabilità e Statistica 2*, for second year students of Bachelor's Degree in Biotechnologies, February 2018 – May 2018

- **At Università Popolare Trentina (CFP-UPT):**

  Teacher of Mathematics, October 2019 – June 2020

- **At Universiteit van Amsterdam:**

  Assistant teacher for Prof. Dr. Rob Stevenson's course *Numerieke Analyse*, for third year students of Bachelor's Degree in Mathematics, February 2017 – June 2017

  Assistant teacher for Dr. Han Peters' course *Wiskunde 3*, for third year students of Bachelor's Degree in Physics, November 2015 – December 2015

Other experiences

- **Private tutor**

  Amsterdam and Utrecht, April 2016 – June 2017.
  Private tutor for WisMon / Bèta onderwijsinstituut

- **Freelance private teacher**

  2008 – present. Freelance private teacher of Mathematics and Physics, for high-school and university students

Mentoring

- **Master thesis**

  Brian Chang, February 2021 – June 2021. Modeling the Spread of Epidemics

  Liufei Yang, February 2021 – June 2021. Developing a Markov-Modulated Process Model for Mobility Processes

Visiting periods

- **Visiting PhD student**

  München, Germany, 15 April 2019 – 15 June 2019. Visiting PhD student at Technische Universität München (TUM), working with Prof. Christian Kuehn and Dr. Hildeberto Jardon Kojakhmetov

Communications

- **18 June 2021, invited speaker**

  Seminar: Edinburgh Dynamical Systems Study Group, University of Edinburgh
  Title: *"A Geometric Singular Perturbation approach to epidemic compartmental models"*

- **4–7 February 2020, organizer and contributed speaker**

  Conference: DSABNS 2020, Trento
  Title: *"A GSPT approach to epidemics on homogeneous graphs"*

- **12 September 2019, invited speaker**

  Seminar: Doc in Progress, Università degli Studi di Trento
  Title: *"An introduction to Geometric Singular Perturbation Theory"*

- **4–5 July 2019, contributed speaker**

  Workshop: Edinburgh Slow-Fast-Ival, Edinburgh
  Title: *"A GSPT approach to perturbed SIR and SIRWS models"*

- **3–6 February 2019, contributed speaker**

  Conference: DSABNS 2019, Naples
  Title: *"A GSPT approach to perturbed SIR and SIRWS models"*

- **21 January 2019, invited speaker**

  Seminar: Oberseminar Dynamics, TUM Munich
  Title: *"A GSPT approach to perturbed SIR and SIRWS models"*

Reviewing

- **Journals**

  Journal of Mathematical Biology

  Advances in Difference Equations

  Mathematical Methods in the Applied Sciences

Attended Conferences & Workshops

- **6–9 September 2021, selected participant**

  Online workshop: MoDiS – Modelling Diffusive Systems: Theory & Biological Applications, Edinburgh

- **12–15 April 2021, selected participant**

  Online Hausdorff School: Diffusive Systems, Bonn

- **1–8 September 2019, selected participant**

  Summer school: Mathematical Biology on the Mediterranean Conference, Samos

- **22–26 July 2019, selected participant**

  Summer school: Multiscale Phenomena in Geometry and Dynamics, München

- **8–11 October 2018, selected participant**

  Workshop: Mathematics for BioMedicine, Rome

- **19–26 August 2018, selected participant**

  Summer school: The Helsinki Summer School on Mathematical Ecology and Evolution 2018, Turku

Membership

- **2017–2021, GNAMPA - INdAM**

  Member of the group *Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro Applicazioni*, of the *Istituto Nazionale di Alta Matematica*