Iulia Martina Bulai

https://iuliamartinabulai.github.io

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Academic positions

Current

2017-Present	**Post-Doc Research Fellow**, *Dipartimento di Ingegneria dell'Informazione, Padova*.
Supervisor	Prof. Morten Gram Pedersen

Education

FEB 2017	**Ph.D. in Mathematics**, *Università degli Studi di Torino*.
Supervisor	Prof. Ezio Venturino
2013	**Master of Science in Mathematics**, *Università degli Studi di Torino, Numerical analysis course*.
Supervisor	Prof. Elena Cordero
2011	**Bachelor's degree in Mathematics**, *Università degli Studi di Torino*.
2008	**Scientific-Technologic High School Diploma**, *Liceo scientifico "N. Rosa"*, Bussoleno.

Teaching and popularization experiences

2016/2017	Teaching assistant at Politecnico di Torino, Analysis 1.
2015/2016	Teaching assistant at Università degli Studi di Torino, Mathematics.
2014	Researchers' Night in Torino, an European level popularization of science event.
2009-2011	Private lessons at high school and secondary school students at Ludus in fabula, Almese.

Research areas of interest

- Spatiotemporal and Stochastic models for endocrine cells; Electrical activity and Ca^+ dynamics in endocrine cells
- Mathematical modelling; Biological systems; Ecoepidemiological mathematical models; Wastewater bioremediation;
- Harmonic analysis, time-frequency analysis and applications to Schrödinger equations; Gabor frames and applications

Participation in research groups

2016-present	Member of Society for Mathematical Biology, SMB
2016-present	Member of Gruppo Nazionale per il Calcolo Scientifico, GNCS-INδAM
2013-2015	Member of Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro Applicazioni, GNAMPA-INδAM

Awards, prizes and grants

JUL 2018	SMB grant: Landahl Travel Grants 2018, 750 USD
JUN 2018	Financial support to participate at 2018 Joint CAMBAM/NSERC-CREATE in Complex Dynamics Summer School, Montreal–CAN
OCT 2016	INδAM grant: Finanziamento GNCS Giovani Ricercatori 2016/2017, 1200 euro
JUN 2016	Best Student Presentation Award at BIOMATH 2016 and the School for Young Scientists, Blagoevgrad–BU
JUN 2016	SMB grant: SMB Financial Aid Grant BIOMATH 2016
JUL-SEP 2016	Erasmus Traineeship grant, University of Osnabrück, Germany
JAN 2016	Financial support to participate at V Southern-Summer School on Mathematical Biology and School on Physics Applications in Biology, San Paolo–BR
2014-2017	Tree-year Ph.D scholarship sponsored by the University of Torino
2008-2013	Scholarship sponsored by Edisu

Visiting position

JAN 2017	Institute of Environmental Systems Research, Osnabrück
AUG-SEP 2016	Institute of Environmental Systems Research, Osnabrück
SEP-MAR 2015	Istituto Superiore Mario Boella (LACE), Torino
FEB-MAR 2014	Numerical Harmonic Analysis Group (NuHAG), Vienna

Participation in schools and conferences

JUL 2018	Contributed talk and chair at **Annual Meeting of the Society for Mathematical Biology and the Japanese Society for Mathematical Biology**, Sydney–AU.
JUN 2018	Participant at **Joint CAMBAM/NSERC-CREATE in Complex Dynamics Summer School** (McGill University), Montreal–CAN.
MAY 2018	Invited contributed talk and chair at **Seminari Padovani di Analisi Numerica, SPAN2018**, Padova–IT.
FEB 2018	Invited contributed talk at **Convegno e Assemblea GNCS 2018**, Montecatini Terme–IT.
FEB 2018	Contributed talk at **Ninth Workshop Dynamical Systems Applied to Biology and Natural Sciences,** DSABNS 2018, Torino – IT.

MAY 2017	Invited contributed talk at **2nd Workshop Franco-Italian Mathematical Ecology Days**, Torino – IT.
JAN-FEB 2017	Contributed talk at **Eight Workshop Dynamical Systems Applied to Biology and Natural Sciences,** DSABNS 2017, Évora – PT.
NOV 2016	Contributed talk at **1st Workshop Franco-Italian Mathematical Ecology Days**, Torino – IT.
JUL 2016	Contributed talk at **16th International Conference Computational and Mathematical Methods in Science and Engineering,** CMMSE2016, Rota – ES.
JUN 2016	Contributed talk at **International Conference on Mathematical Methods and Models in Biosciences and the School for Young Scientists,** BIOMATH2016, Blagoevgrad–BU.
JAN 2016	Participant at **School on Physics Applications in Biology,** (ICTP South American Institute for Fundamental Research), San Paolo–BR.
JAN 2016	Participant at **V Southern-Summer School on Mathematical Biology,** (ICTP South American Institute for Fundamental Research), San Paolo–BR.
DEC 2015	Poster at **Welcome home**, Turin – IT.
SEP 2015	Contributed talk at **13th International Conference Of Numerical Analysis And Applied Mathematics,** ICNAAM2015, Rhodes – GR.
SEP 2015	Participant at **CAMo: from molecules to modelling**, Turin – IT.
JUL 2015	Contributed talk at **15th International Conference Computational and Mathematical Methods in Science and Engineering,** CMMSE2015, Rota – ES.
MAR 2015	Contributed talk at **Seminari dei dottorandi**, Turin – IT.
NOV 2014	Contributed talk at **Seminari dei dottorandi**, Turin – IT.
OCT 2014	Participant at **Computational Harmonic Analysis - with Applications to Signal and Image Processing School,** (CIRM), Marsiglia – FR.
JUN 2014	Participant at **Strobl14: Modern time-frequency analysis**, Strobl – AT.

Publications

Peer-reviewed journals

JP12 I. M. Bulai, M. G. Pedersen, Hopf bifurcation analysis of the fast subsystem of a polynomial phantom burster model. Accepted in *Dolomites Research Notes on Approximation*, 2018.

JP11 P. Baptista, I. M. Bulai, T. Gomes, E. Venturino, Modeling the interactions among phythopatogens and phyllosphere microorganisms for the biological disease control of *Olea europaea* L.. Accepted in *Mathematical Biosciences*, 2018.

JP10 P. K. Tiwari, I. M. Bulai, E. Venturino, A. K. Misra, Modelling the effect of human population on the fish survival in water bodies. Accepted in *Journal of Biological Systems*, 2018.

JP9 I. M. Bulai, F. Spina, G. C. Varese, E. Venturino, Waste-water bioremediation using white rot fungi: validation of a dynamical system with real data obtained in laboratory. *Mathematical Methods in the Applied Sciences*, 2018.

JP8 P. K. Tiwari, I. M. Bulai, A. K. Misra and E. Venturino, Modelling the direct and indirect effects of pollutants on the survival of fish in water bodies. *Journal of Biological Systems*, 2017.

JP7 I. M. Bulai, E. Venturino. Shape effects on herd behaviour in ecological interacting population models. *Mathematics and Computers in Simulation*, 2017.

JP6 I. M. Bulai, E. Venturino. Two mathematical models for dissolved oxygen in a lake. *Journal of Mathematical Chemistry*, 2017.

JP5 I. M. Bulai, E. Venturino. The Beddington-De Angelis and the HTII product response functions: application to polluted ecosystems biodegradation. *AIP Conference Proceedings,* AIP Conf. Proc. 1738, 390002 (2016).

JP4 M. Righero, I. M. Bulai, M. A. Francavilla, F. Vipiana, Mirko Bercigli, A. Mori, M. Bandinelli, G. Vecchi. Hierarchical bases preconditioner to enhance convergence of the CFIE with multiscale meshes. *IEEE Antennas and Wireless Propagation Letters*, 2016.

JP3 I. M. Bulai, E. Venturino. Biodegradation of organic pollutants in a water body. *Journal of Mathematical Chemistry*, 2016.

JP2 M. Berra, I. M. Bulai, E. Cordero and F. Nicola. Gabor Frames of Gaussian Beams for the Schrödinger equation. *Applied and Computational Harmonic Analysis*, 2015.

JP1 I. M. Bulai, R. Cavoretto, B. Chialva, D. Duma, E. Venturino. Comparing disease-control policies for interacting wild populations. *Nonlinear Dynamics*, 2014.

Book Chapters

BC1 P. Baptista, C.Berardo, I. M. Bulai, T. Gomes, E. Venturino, Modeling the endophytic fungus *Epicoccum nigrum* action to fight the "olive knot" disease caused by *Pseudomonas savastanoi* pv. *savastanoi (Psv)* bacteria in *Olea europea* trees. *To appear in BIOMAT 2017 (series of books)*, 2017.

Conference proceedings

P5 I. M. Bulai, A.C. Esteves E. Venturino. A mathematical model for a diseased orange tree. *Proceedings of the 17th International Conference on Computational and Mathematical Methods in Science and Engineering*, 2017.

P4 I. M. Bulai, E. Venturino. Competition between algae and fungi in a lake: a mathematical model. *Proceedings of the 16th International Conference on Computational and Mathematical Methods in Science and Engineering*, 2016.

P3 I. M. Bulai, F. Spina, G. C. Varese, E. Venturino. Wastewater bioremediation using white rot fungi: validation of a dynamical system. *Biomath Communications*, Vol 3, No 1 (2016).

P2 I. M. Bulai, E. Venturino. A mathematical model for the biodegradation of organic pollutants in a lake. *Proceedings of the 15th International Conference on Computational and Mathematical Methods in Science and Engineering,* 2015.

P1 I. M. Bulai, B. Chialva, D. Duma, E. Venturino. Do niches help in controlling disease spread in ecoepidemic models? *Proceedings of the 2013 International Conference on Computational and Mathematical Methods in Science and Engineering*, 2013.

Work in progress

- I. M. Bulai, S. Jamaleddine and A. L. Jenner and F. Guichard, Functional responses, coupling strength, and phase dynamics of predator-prey systems
- I. M. Bulai, F. Montefusco, Exploiting Ultrasensitivity for Biomolecular Implementation of a Free-Error Control System.
- I. M. Bulai, M. G. Pedersen, Bursting versus spiking: Changing the action potential amplitude for stochastic Ca2+ channel dynamics
- I. M. Bulai, M. G. Pedersen, Burst of burst problem for a phantom bursting model.
- I. M. Bulai, H. Laurie, E. Venturino, Herding induced by encounter rate, with predator pressure influencing prey response.
- I. M. Bulai, M. G. Pedersen, Biophysical model for stopping waves problem.
- I. M. Bulai, M. G. Pedersen, Stopping waves: Geometric analysis of coupled bursters in an asymmetric excitation field
- I. M. Bulai, F. Hilker, Competing for resources in the presence of infection: Mathematical models of foraging interference and disease transmission.
- I. M. Bulai, S. Depickère, V. Hirata, E. Vargas Bernal, Influence of asymptomatic malaria in malaria transmission: a mathematical model.
- I. M. Bulai, A. C. Esteves, E. Venturino, A mathematical model for an orange tree and the presence of a pathogen and beneficial fungus on it.

Other works

- I. M. Bulai, M. Righero, G.Vecchi, F. Vipiana, Algorithms for the generation of MR basis using interpolant gRWG and Algorithm for cell grouping strategy. *In cooperation with the research institute ISMB, LACE group.*

Organized conferences/ workshops

SEP 2015	Co-organizer of **CAMo: from molecules to modelling**, Turin – IT.
NOV 2016	Co-organizer of **Franco-Italian Mathematical Ecology Days**, Turin – IT.

Languages written and spoken

Romanian	Mother tongue	
Italian	Advanced	*self-assessed european level C2.*
English	Advanced	*self-assessed european level C1.*
French	Basic	*self-assessed european level A2.*
Hungarian	Basic	*self-assessed european level A2.*

Other skills

- Programming in Visual Basic, C++.
- Use of mathematical software GeoGebra, GiD, Maple, Matlab, Statistica, Xppaut, CalC, Latex.
- B italian driving licence, climbing.