LUCA SALUZZI

luca.saluzzi@gmail.com
Piazzale Aldo Moro, 5, Roma
https://sites.google.com/view/lucasaluzzi

RESEARCH INTERESTS

Scientific Computing, Numerical Analysis, Machine Learning, Closed-Loop Control, Hamilton–Jacobi-Bellman equations, Reduced Order Modeling, Proper Orthogonal Decomposition.

EMPLOYMENT

- **Sapienza, University of Rome, Italy.** *September 2020–present*
  PostDoctoral Researcher in the group of Prof. Maurizio Falcone.
  Research Area: Numerical Optimal Control in High Dimension.
- **Logol, Chiasso, Switzerland.** *January 2020–August 2020*
  Stage in the Artificial Intelligence team.

EDUCATION

- **Gran Sasso Science Institute, L'Aquila, Italy.** *November 2016–Febraury 2020*
  Ph.D. cum Laude in Mathematics of Natural, Social and Life Sciences.
  Advisor: Prof. Maurizio Falcone.
  Thesis: *A Tree-Structure Algorithm for Optimal Control Problems via Dynamic Programming.*
  Thesis referees: L. Grüne, D. Kalise.
  Committee: E. Carlini, R. DAmbrosio, L. Grüne, D. Kalise, M. Palladino.
- **Sapienza, University of Rome, Italy.** *October 2014-September 2016*
  M.Sc. in Applied Mathematics
  Advisors: Prof. Eugenio Montefusco, Prof. Ana Carpio.
  Final Evaluation: 110/110 cum laude.
  Thesis: Angiogenesis, study of a model through continuous and discrete maximum principles.
- **Sapienza, University of Rome, Italy.** *October 2010-July 2013*
  B.Sc. in Mathematics.
  Final Evaluation: 110/110 cum laude.

PUBLICATIONS, CONFERENCE PROCEEDINGS, PREPRINTS, THESES

Peer Reviewed Publications

1. A. Alla, M. Falcone, and L. Saluzzi, *An efficient DP algorithm on a tree-structure for finite horizon optimal control problems*, SIAM Journal on Scientific Computing, 41: A2384-A2406, 2019.
2. A. Alla, L. Saluzzi, *A HJB-POD approach for the control of nonlinear PDEs on a tree structure,* Applied Numerical Mathematics, 155: 192-207, 2020.

3. A. Alla, M. Falcone, and L. Saluzzi, *A tree structure algorithm for optimal control problems with state constraints*, Rendiconti di Matematica e delle sue Applicazioni, 41: 193-221, 2020.

Submitted Papers

4. L. Saluzzi, A. Alla, M. Falcone, *Error estimates for a tree structure algorithm solving finite horizon control problems*, submitted, 2020.
`https://arxiv.org/abs/1812.11194`

Peer Reviewed Conference Proceedings

5. A. Alla, M. Falcone, L. Saluzzi, *High-order Approximation of the Finite Horizon Control Problem via a Tree Structure Algorithm*, in Conference Proceedings of the 3rd IFAC Conference on Control of Systems Governed by Partial Differential Equations, 52 (2), 19-24, 2019.

HONORS AND AWARDS

- **INdAM-GNCS** Finanziamento Giovani Ricercatori 2020-2021. Research Project: Numerical approximation for high dimensional optimal control problems on a tree graph.
- **Banco Santander ICIAM2019-Valencia Scholarship Program** Financial support award to attend ICIAM 2019 in Valencia, Spain, 2019.
- **Sissa, Trieste** Study in SISSA fellowship (SIS), Italy, 2019.
- **Fields Institute** Long Term Visitor grant at Field Institute, Canada, 2018.
- **European Region Action Scheme for the Mobility of University Students.** Erasmus stipend exchange student for a six-month visit at Universidad Complutense, Spain, 2016.
- **Sapienza, University of Rome, Italy.** *International Thesis Scholarship* for a research visit at Universidad Complutense, Spain, 2016.
- **Sapienza, University of Rome, Italy.** Honours Programme for Master degree, 2016.
- **Sapienza, University of Rome, Italy.** Honours Programme for Bachelor degree, 2014.

CONFERENCES, SEMINARS, GIVEN TALKS

Invited Conference Talks

- ICODE workshop on numerical solution of HJB equation, Paris, France *January 2020*
  A HJB-POD approach for the control of nonlinear PDEs on a tree structure.
- RICAM Special Semester on Optimization (Feedback control), Linz, Austria *November 2019*
  A HJB-POD approach for the control of nonlinear PDEs on a tree structure.
- Workshop on Control Theory and Applications, L'Aquila, Italy *March 2019*
  A Dynamic Programming approach for PDE-constrained optimal control on a tree structure
- Numerical methods for multiscale control problems and applications, Verona, Italy *February 2019*

A Dynamic Programming approach in a tree structure for finite horizon optimal control problems.

Contributed Conference Talks

- The 9th International Congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain. *July 2019*
  A DP approach for PDE-constrained optimal control on a tree structure.
- Summer school: The Mathematics of Mechanobiology, Cetraro, Italy. *August 2018*
  A DP approach on a tree structure for finite horizon optimal control problems and applications.
- 10th Workshop SDS2018, Structural Dynamical Systems: Computational Aspects, Capitolo, Italy *June 2018*
  A discrete time Dynamic Programming approach on a tree structure for finite horizon optimal control problems.
- Focus Program on Nanoscale Systems and Coupled Phenomena: Mathematical Analysis, Modeling, and Applications, Toronto, Canada *April 2018*
  Well posedness and numerical schemes for a model of angiogenesis.

Seminars

- Seminari di Modellistica Numerica, Sapienza University of Rome, Italy. *January 2020*
  A Tree-Structure algorithm for optimal control problems via Dynamic Programming.
  Invited by Prof. Elisabetta Carlini.
- Seminari di Modellistica Numerica, Sapienza University of Rome, Italy. *November 2018*
  Discrete time numerical schemes for finite horizon optimal control problems.
  Invited by Prof. Maurizio Falcone.
- Kolloquium, Constance, Germany. *November 2018*
  A DP approach on a tree structure for finite horizon optimal control problems and extension to high order.
  Invited by Prof. Stefan Volkwein.

TEACHING EXPERIENCE

Lecturer at Sapienza, University of Rome, Italy
Programming and Computing Laboratory, Department of Mathematics. *Autumn 2020*

Teacher assistant at Sapienza, University of Rome, Italy
Numerical analysis, Department of Mathematics. *Autumn 2020*

Lecturer at Sapienza, University of Rome, Italy
Matlab, Department of Mathematics. *Autumn 2019*

ACADEMIC SERVICE

Referee for Journal of Optimization Theory and Applications.

PARTICIPATION IN RESEARCH PROJECTS

- Project GNCS-INDAM: Approssimazione numerica di problemi di natura iperbolica ed applicazioni (2019). Responsable: Dr. Elisabetta Carlini.
- Project GNCS-INDAM: Metodi Numerici per problemi di controllo multiscala (2018). Responsable: Dr. Giacomo Albi.

COMPUTER SKILLS

C,C++, Fortran, LaTeX, Linux, Matlab, Microsoft Windows, OpenOffice, C#, React Native.

LANGUAGES

Italian: Native Speaker
English: Fluent
Spanish: Intermediate