


## PERSONAL INFORMATION

**Dimitri BREDA**

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Gender male | Date of birth 9 October 1974

Nationality italian



## POSITIONS AND EDUCATION

December 2017 – today

**founder and head of CDLab – Laboratory of Computational Dynamics**

Department of Mathematics, Computer Science and Physics  
University of Udine

link <http://cdlab.uniud.it/>

national scientific habilitation

**Full Professor**

scientific area 01/A5 Numerical Analysis

since 28 March 2017

indicators papers 29/11, citations 491/110, *h*-index 11/7

December 2016 – today

**Associate Professor**

Department of Mathematics, Computer Science and Physics  
University of Udine

scientific area MAT/08 Numerical Analysis

since 1 December 2016

national scientific habilitation

**Associate Professor**

scientific area 01/A5 Numerical Analysis

since 16 December 2013

indicators norm. papers 22/14, norm. citations 22.91/6.06, *h*-index 7/4

October 2007 – November 2016

**Assistant Professor**

Department of Mathematics and Computer Science  
University of Udine

scientific area MAT/08 Numerical Analysis

since 23 October 2007 confirmed on 23 October 2010

March 2006 – October 2007

**Post-Doc fellow**

Department of Mathematics  
University of Trento

scientific area MAT/08 Numerical Analysis

supervisor Mimmo IANNELLI

title Modellizzazione e analisi di popolazioni strutturate

December 2004 – November 2005 **Post-Doc fellow**  
 Department of Mathematics and Computer Science  
 University of Trieste  
**scientific area** MAT/08 Numerical Analysis  
**supervisor** Stefano MASET  
**title** Trattamento numerico di modelli differenziali con ritardo

December 2003 – November 2004 **Post-Doc fellow**  
 Department of Mathematics and Computer Science  
 University of Udine  
**scientific area** MAT/08 Numerical Analysis  
**supervisor** Rossana VERMIGLIO  
**title** Metodi numerici per lo studio della stabilità di sistemi differenziali con ritardo ed applicazioni

2000–2003 **PhD in Computational Mathematics**  
 University of Padua  
**cycle** XVI **scientific area** MAT/08 Numerical Analysis  
**supervisor** Rossana VERMIGLIO **co-supervisor** Stefano MASET  
**thesis** Numerical computation of characteristic roots for delay differential equations  
**defended on** 5 February 2004

1993-1998 **Laurea in Mechanical Engineering**  
 University of Udine  
**specialization** energetics  
**thesis** Analisi di stabilità e simulazione di un sistema di compressione industriale con controllo attivo del pompaggio  
**advisor** Pietro GIANNATTASIO **co-advisor** Franco BLANCHINI  
**defended on** 17 December 1998  
**final evaluation** 110/110 cum laude

1988-1993 **Istituto Tecnico Industriale**  
 I.T.I.S. "A. Malignani", Udine  
**specialization** aeronautics  
**final evaluation** 60/60

#### SCIENTIFIC INDICATORS

scopus **h-index** 16 **total citations** 895 **most cited** 189

WOS **h-index** 15 **total citations** 741 **most cited** 157

Google Scholar **h-index** 20 **total citations** 1560 **most cited** 286

**national scientific habilitation** simulation based on 2005-2020 (personal/required)  
 full professor: **papers** 33/13 **citations** 807/160 **h-index** 15/7  
 commissioner: **papers** 33/22 **citations** 807/405 **h-index** 15/12

simulation based on 2006-2021 (personal/required)

full professor: [papers](#) 29/13 [citations](#) 610/160 [h-index](#) 15/7

commissioner: [papers](#) 29/22 [citations](#) 610/405 [h-index](#) 15/12

## RESEARCH

**summary** Carried out mostly in the area of numerical analysis and computational mathematics, especially related to dynamical systems, it extends to nonlinear and functional analysis with main applications in population dynamics and control engineering.

### main arguments

- reduction of infinite dimensional dynamical systems (functional evolution equations) to finite dimensional dynamical systems (ordinary differential equations) through collocation techniques: theoretical implications and use of the approximating system for bifurcation analysis;
- analysis and numerical computation of characteristic values and other stability indicators (e.g., Lyapunov exponents) for complex functional equations (differential or not; with autonomous, periodic or generic coefficients, retarded, neutral or mixed): structured population dynamics, epidemiological models, partial differential equations of evolution type, problems with stochastic delays;
- development of efficient methods and relevant software for analyzing stability of equilibria, periodic orbits, chaotic attractors and computing bifurcation diagrams and stability maps; efficient continuation techniques for complex models;
- theoretical analysis of the locus of characteristic roots in the complex plane for functional equations and relevant implications on the dynamics;
- numerical approximation of  $R_0$  as spectral radius of infinite-dimensional operators for structured and retarded models in population dynamics;
- Floquet theory and Poincaré maps for dynamical systems generated by functional equations of differential and renewal type; numerical computation of periodic solutions and Floquet multipliers;
- deep interest in the dynamical analysis of biological models and systems biology in general.

**projects** indicated by “type, funding entity and period: **title**, coordinator (coordinator affiliation)”

### currently under review

1. FISR 2020: **ICAR0: Interface for Computing and Analyzing R0**, D. Breda (Univ. Udine);
2. PRIN 2020: **Integrated Mathematical Approaches to Socio-Epidemiological Dynamics**, A. Tosin (Pol. Torino).

### national projects

1. GNCS 2020: **Analisi numerica di sistemi evolutivi complessi**, D. Breda (Univ. Udine);
2. GNCS 2019: **Problemi di evoluzione e loro discretizzazione: questioni di stabilità lineare e non lineare**, R. D’Ambrosio (Univ. L’Aquila);
3. GNCS 2018: **Approssimazione numerica di problemi di evoluzione: aspetti deterministici e stocastici**, R. D’Ambrosio (Univ. L’Aquila);
4. proposer PRID 2017: **Sistemi Dinamici e Applicazioni**, F. Zanolin, Univ. Udine;
5. GNCS 2017: **Analisi e sviluppo di metodologie numeriche per certi tipi non classici di sistemi dinamici**, S. Maset (Univ. Trieste);
6. local coordinator SPADISCO 2016 (F) **Systèmes à Paramètres Distribués avec Contraintes**, CNRS International Research Network, G. Valmorbidia (L2S, CentraleSupélec);
7. local coordinator PRIN 2015 proposal: **Innovative methods in the analysis of epidemic models and data**, A. Pugliese (Univ. Trento);
8. GNCS 2016: **Analisi numerica di certi tipi non classici di equazioni di evoluzione**, S. Maset (Univ. Trieste);
9. GNCS 2015: **Analisi numerica di sistemi dinamici infinito-dimensionali e non regolari**, N. Guglielmi (Univ. L’Aquila);
10. Spanish Internship 2014 for J. Sánchez Sanz (BCAM Bilbao), D. Breda (Univ. Udine);
11. GNCS 2014: **Analisi numerica di problemi differenziali infinito-dimensionali e discontinui**, N. Guglielmi (Univ. L’Aquila);

12. GNCS 2013: **Metodi numerici per sistemi evolutivi: equazioni funzionali infinito dimensionali ed equazioni differenziali discontinue**, N. Guglielmi (Univ. L'Aquila);
13. GNCS 2011: **Simulazione numerica di equazioni integrali funzionali di Volterra con ritardo con applicazioni ai modelli di dinamica di popolazione**, R. Vermiglio (Univ. Udine);
14. GNCS 2010: **Metodi numerici e stabilità di equazioni differenziali funzionali**, M. Zennaro (Univ. Trieste);
15. GNCS - Giovani Ricercatori 2009: **Calcolo degli esponenti di Lyapunov per equazioni differenziali con ritardo**, D. Breda (Univ. Udine);
16. Third-party convention: **Tecniche di simulazione numerica e virtualizzazione nella progettazione di stampi per materiali a base polimerica**, F. Blanchini (Univ. Udine);
17. GNCS - Giovani Ricercatori 2008: **Calcolo degli esponenti di Lyapunov per equazioni differenziali con ritardo**, D. Breda (Univ. Udine);
18. MIUR/PRIN 2007: **Metodi numerici per sistemi evolutivi di equazioni differenziali funzionali ordinarie ed alle derivate parziali**, A. Bellen (Univ. Trieste);
19. FIRB 2004: **Metodi dell'analisi matematica in biologia, medicina e ambiente**, E. Beretta (Univ. Urbino);
20. MIUR/PRIN 2004: **Metodi numerici per equazioni differenziali funzionali**, M. Zennaro (Univ. Trieste);
21. Intergruppo INdAM 2004: **Metodi numerici e software matematico per problemi di evoluzione**, M. Zennaro (Univ. Trieste);
22. Intergruppo INDAM 2004 **Integrazione di Sistemi Complessi in biomedicina: modelli, simulazione, rappresentazione**, A. Quarteroni (Polit. Milano - EPFL);
23. GNCS 2003: **Problematiche di interfacciamento tra metodologie numeriche per equazioni differenziali ordinarie e equazioni alle derivate parziali**, M. Zennaro (Univ. Trieste);
24. Intergruppo INdAM 2003: **Metodi e modelli matematici nella dinamica di popolazione**, M. Iannelli (Univ. Trento).

#### international project proposals

1. NSF 2015 (USA) **Approximation of Infinite Dimensional Dynamics**, E. Van Vleck (Univ. Kansas);
2. GALILEO 2009 (I-F) **Simulation of complex systems in ecology and epidemiology**, M. Iannelli (Univ. Trento), M. Langlais (Univ. Bordeaux 2);
3. TOP GO 2009 (NL) **The interplay within-host immunology and population-level transmission of infectious disease**, O. Diekmann (Univ. Utrecht);
4. PIRE 2009 (USA) **Controlling multi-scale delay-critical engineered and biological networks**, R. Sipahi (Northeastern Univ.);
5. STREP 2007 (UE) **DELIS - Delays in interconnected systems**, S.-I. Niculescu (Univ. Paris Sud 11).

**collaborations** indicated by "period: venue, possible collaborator(s) (collaborator affiliation(s), subject), title of possible seminar (by myself if outgoing, by guest otherwise)"

1. 08/11/19: Department of Mathematics, Computer Science and Physics, Univ. Udine (Italy), M. Nonino, (SISSA, model order reduction), **Overcoming slowly decaying Kolmogorov n-width by transport maps: application to model reduction of fluid dynamics and fluid-structure interaction problems**;
2. 09-13/09/19: Department of Mathematics, Computer Science and Physics, Univ. Udine (Italy), B. Krauskopf, H. Osinga, (Univ. Auckland, delay equations, dynamical systems, numerical continuation and bifurcation), **A space-filling pancake in crochet and steel**, "i mercoledì del DMIF";
3. 04/07/19: Department of Mathematics, Computer Science and Physics, Univ. Udine (Italy), F. Scarabel, (Univ. York, pseudospectral reduction of nonlinear delay equations), **Back to ODE: a numerical approach for periodic solutions of delay equations**;
4. 25/08-01/09/18: Department of Mathematics and Statistics, Univ. York (Toronto, Canada), J. Wu (applications of delay differential and renewal equations to population dynamics and infectious diseases);

5. 26-27/07/18: Department of Mathematics, Computer Science and Physics, Univ. Udine (Italy), J. Wu (Univ. York, applications of delay differential and renewal equations to population dynamics and infectious diseases), **Estimating the spectrum of the Poincaré map of delay equations with periodic development delays: models, threshold dynamics and vector-borne disease risk prediction**, “i mercoledì del DMIF”;
6. 06-11/05/18: Department of Mathematics, Computer Science and Physics, Univ. Udine (Italy), J. Ripoll (Univ. Girona, computation of the basic reproduction number in population dynamics), **Asymptotic behaviour of ecological models: reproduction number vs Malthusian parameter**;
7. 21-26/04/17: Department of Mathematics, Univ. Utrecht (The Netherlands), O. Diekmann, S. Verduyn-Lunel, (delay differential and renewal equations, their evolution operators and characteristic equations);
8. 17-18/11/16: Department of Mathematics, Univ. Trento, M. Iannelli, A. Pugliese (population dynamics), **Looking into the dynamics of structured populations**;
9. 15-19/05/16: Department of Mathematics, Univ. Utrecht (The Netherlands), O. Diekmann, S. Verduyn-Lunel, Y. Kuznetsov, M. Gyllenberg, H. Metz (retarded differential and renewal equations and relevant methods for the study of population dynamics);
10. 29/02-02/03/16: Department of Mathematics and Applications, Univ. Napoli Federico II (Italy), B. Buonomo (models and methods of behavioral epidemiology), **Looking into the dynamics of structured populations**;
11. 11/05-31/07/15: Department of Mathematics and Computer Science, Univ. Udine (Italy), F. Scarabel (Univ. Helsinki, discretization of nonlinear retarded functional equations and population dynamics);
12. 15-19/12/14: Department of Mathematics and Computer Science, Univ. Udine (Italy), F. Scarabel (Univ. Helsinki, discretization of nonlinear retarded functional equations and population dynamics);
13. 01/09-30/11/14: Department of Mathematics and Computer Science, Univ. Udine (Italy), J. Sánchez Sanz (BCAM Bilbao, computation of eigenvalues for linear retarded functional equations, both differential and not);
14. 01-31/07/14: Department of Mathematics and Computer Science, Univ. Udine (Italy), F. Scarabel (Univ. Helsinki, discretization of nonlinear retarded functional equations and population dynamics);
15. 10-11/04/14: Department of Mathematics and Computer Science, Univ. Udine (Italy), O. Diekmann (Univ. Utrecht, delay differential equations and population dynamics);
16. 03-14/09/13: Department of Mathematics and Computer Science, Univ. Udine (Italy), J. Sánchez Sanz (BCAM Bilbao, computation of eigenvalues for linear retarded functional equations, both differential and not);
17. 18-30/03/12: Department of Mathematics, Univ. Utrecht (The Netherlands), O. Diekmann (delay differential equations and population dynamics), **Computing Lyapunov exponents for systems with delay**;
18. 17-22/05/11: Department of Mathematics, Kansas Univ. (Lawrence, Kansas), E. Van Vleck (computation of Lyapunov exponents for delay differential equations), **Numerics for stability analysis of delay systems and population dynamics**;
19. 19-22/11/08: School of Mathematics, GeorgiaTech (Atlanta, Georgia), L. Dieci (computation of Lyapunov exponents for delay differential equations);
20. 9-19/11/08: Department of Mathematics, Kansas Univ. (Lawrence, Kansas), E. Van Vleck (computation of Lyapunov exponents for delay differential equations), **On computing the spectrum of mixed-type functional differential equations**;
21. 02/05/07: Dipartimento di Matematica, Univ. Trento, M. Iannelli (population dynamics), **Delay, population and population with delay: robust approaches to asymptotic stability**;
22. 28/12/05: Dipartimento di Matematica e Informatica, Univ. Trieste, S. Maset (discussion research fellowship), **Pseudospectral techniques for stability computation of linear time delay systems**;
23. 18-24/09/05: Mechanical Engineering Department, Univ. of Connecticut (Storrs, Connecticut), N. Olgac (delay models, robust asymptotic stability of steady states and efficient determination of stability charts), **Pseudospectral approximation of eigenvalues of derivative operators with non-local boundary conditions and Linear time delay systems: from characteristic roots to stability charts**;
24. 14-30/04/05: Department of Mathematics and Statistics, McGill Univ. (Montreal), A.R. Humphries (nonlinear discrete Shroedinger equations, asymptotic stability of travelling waves solutions, retarded-advanced equations), **Linear time delay systems: from characteristic roots to stability charts and Pseudospectral approximation of eigenvalues of derivative operators with non-local boundary conditions**;

25. 08-09/03/05: Dipartimento di Matematica, Univ. Trento, M. Iannelli and C. Cusulin (age-structured populations dynamics, asymptotic stability of steady states);
26. 11/08-05/09/03: Department of Computer Science, K.U. Leuven (Leuven), D. Roose, T. Luzyanina and K. Verheyden (numerical approximation of characteristic roots and multipliers for delay differential equations), **Infinitesimal generator approximation for the computation of characteristic roots for DDEs and Use of pseudospectral differencing methods for the discretization of the solution operator semigroup of linear DDEs.**

Besides those above cited, scientific collaborations are mentioned with Andò A. (Univ. Udine), Beretta E. (CIMAB, Univ. Milano), Blanchini F. (Univ. Udine), Bozzo E. (Univ. Udine), Conzatti F. (Univ. Udine), De Graaf W. (Univ. Utrecht), De Reggi (Univ. Udine), Esseni D. (Univ. Udine), Florian F. (Univ. Zurich), Franceschetti A. (Univ. Trento), Gava G. (Univ. Udine), Getto P. (Univ. Dresden), Giordano G. (Univ. Trento), Gyllenberg M. (Univ. Helsinki), Kuniya T. (Univ. Kobe), Liessi D. (Univ. Udine), Liu S. (Harbin Inst. Tech.), Maset S. (Univ. Trieste), Menegon G. (Univ. Udine), Michiels W. (K.U.Leuven), Nakata Y. (BCAM), Nazzi F. (Univ. Udine), Orosz G. (Univ. Michigan), Palestri P.P. (Univ. Udine), Paussa A. (Univ. Udine), Pugliese A. (Univ. Trento), Ripoll J. (Univ. Girona), Sadeghpour M. (Univ. Michigan), Selmi L. (Univ. Udine), Sipahi R. (Northeastern Univ.), Specogna R. (Univ. Udine), Trevisan F. (Univ. Udine), Vermiglio R. (Univ. Udine), Visetti D. (Univ. Trento).

conferences W=Workshop, C=Conference, I=International, N=National.

participations indicated by “period, congress title (type, venue)”

1. 26/10/20, **Virtual Thematic Workshop in Math Sciences: Nonlinear Dynamical Systems and Delay Equations** (IW, zoom);
2. 1-2/10/20, **Online Delay Days** (IW, meet);
3. 22/06/20, **Modellistica e Covid-19 Giornata di studio online** (NW, zoom);
4. 20/11/19, **Workshop on Joint Spectral Radius** (NW, Udine);
5. 8-11/11/16, **Numerical Analysis of Evolution Equations** (IW, Innsbruck)
6. 29/05/15, **Mini Workshop on Dynamical Systems** (NW, Udine);
7. 15-19/04/13, **Mathematics and Biology: a Roundtrip in the Light of Suns and Stars** (IW, Leiden);
8. 06-09/09/10, **Dolomites Research Week on Approximation** (IW, Alba di Canazei).
9. 27-28/09/07, **Workshop on Topics in dynamical systems** (NW, Udine);
10. 20-23/10/04, **Workshop on Exponential Integrators** (IW, Innsbruck);
11. 08-10/09/04, **5th IFAC Workshop on Time Delay Systems** (IW, Leuven);
12. 10/06/04, **Seminar on Numerical Analysis and Geometric Integration** (IW, Ljubljana);
13. 09-11/02/04, **Convegno Nazionale GNCS** (NC, Montecatini Terme);
14. 08-12/09/03, **Delay equations and their applications** (IW, Bristol);
15. 22-24/01/03, **CNRS-NSF workshop on Advances in time-delay systems** (IW, Paris);
16. 01-04/07/01, **Structural dynamical systems in linear algebra and control, computational aspects** (IW, Capitolo);
17. 05-06/02/01, **High performance scientific computing** (IW, Bologna).

contributions indicated by “period, congress title (type, venue), contribution type (CT=Contributed Talk, IT=Invited Talk, IS=Invited Speaker, CP=Contributed Poster, ITU=Invited Tutorial, IP=Interactive Paper, MS= minisymposium, SS=special session): *contribution title*”

1. 04-07/02/20, **Eleventh Workshop on Dynamical Systems Applied to Biology and Natural Sciences** (Trento), CT *periodicity, delays and numerical methods in biomathematics: a recent account*;
2. 23-24/01/20, **A two-day workshop on structure-preserving approximation of evolutionary problems and applications** (L'Aquila), IT *periodicity, delays and numerical methods in biomathematics: a recent account*;
3. 02-07/09/19, **XXI U.M.I. Congress** (Pavia), IT in SS “Sistemi dinamici e metodi numerici per le equazioni differenziali”: *Sulle orbite periodiche di sistemi dinamici su spazi di Banach*;
4. 17-21/06/19, **11th colloquium on the qualitative theory of differential equations** (Szeged), IT *stability of periodic solutions of renewal equations*;



5. 03-06/02/19, **Tenth Workshop on Dynamical Systems Applied to Biology and Natural Sciences** (Napoli), CT *How fast is the linear chain trick?*;
6. 28-30/06/18, **14th IFAC workshop on Time Delay Systems** (Budapest), IT *Pseudospectral approximation of characteristic roots and multipliers: how multiplicities affect convergence* - MS "Spectral Methods for Rightmost Roots in LTI Time Delay Systems";
7. 28-30/06/18, **14th IFAC workshop on Time Delay Systems** (Budapest), CT *Delay in population dynamics: challenges and opportunities* - organizer MS "Numerical analysis for delay equations in population dynamics";
8. 14-16/02/18, **convegno nazionale GNCS** (Montecatini Terme), CT *Metodi numerici per l'analisi di stabilità di popolazioni strutturate*;
9. 07-09/02/18, **Ninth Workshop on Dynamical Systems Applied to Biology and Natural Sciences** (Torino), CT *Improving numerical continuation for complex delay models of structured populations*;
10. 07-09/02/18, **Ninth Workshop on Dynamical Systems Applied to Biology and Natural Sciences** (Torino), CT *Pseudospectral methods for delay equations in population dynamics*;
11. 05-07/02/18, **Workshop on Dynamical Systems** (Udine), IT *Numerical methods for infinite-dimensional dynamical systems from delay equations: a survey on the activities of the CD-Lab*;
12. 22-24/11/17, **DElay and COstraints in Distributed parameter systems** (Gif-sur-Yvette), IT *15 years or so of pseudospectral methods for delay equations*;
13. 21-24/06/16, **SciCADE** (Bath), CT *Delay equations and characteristic roots: stability (and more) from a single curve* - organizer of MS "Numerics, dynamics and models of delay equations";
14. 04-05/07/17, **Populations in epidemics and ecology – Modeling and numerical simulations** (BCAM - Bilbao), IS: *numerical analysis of delay equations for structured populations*;
15. 21-24/06/16, **Stability and Discretization Issues in Differential Equations - (SDIDE)** (Trieste), IT: *approximating the dynamics of delay models by pseudospectral methods: infinitesimal generator for the linear case*;
16. 07-12/09/15, **XX U.M.I. Congress** (Siena), IT in SS "Metodi numerici per le equazioni differenziali ordinarie": *Dalle equazioni differenziali funzionali con ritardo alle equazioni differenziali ordinarie*;
17. 19-22/05/15, **Short Thematic Program on Delay Differential Equations - Structured Delay Systems** (Toronto), IS: *Structured populations: how challenging is Daphnia?* and CP: *Dynamics of Host-Parasitoid Interactions and Coexistence of Different Hosts*;
18. 07-11/07/14, **10th AIMS Conference on Dynamical Systems, Differential Equations and Applications** (Madrid), IT in SS "Delay equations applied to population dynamics": *Numerical analysis for eigenvalues of structured population dynamics: the Daphnia model*;
19. 03-05/07/14, **Investigating Dynamics in Engineering and Applied Science (IDEAS)** (Budapest), IS: *Pseudospectral projection of nonlinear delay differential equations: back to the ordinary world*;
20. 10-11/12/13, **Dynamical Systems and Applications** (BCAM Bilbao), IS: *From delay differential equations to ordinary differential equations (through partial differential equations)*;
21. 16/07/13, **Time Delay Systems – Stability & Control in Applications** (Zurigo), organizer and speaker: *From delay differential equations to ordinary differential equations*;
22. 04-08/06/12, **Recent trends in DDEs** (Cortona), IS: *Computing Lyapunov exponents for systems with delay*;
23. 19-21/12/11, **MIMMO.BIO** (Trento), IT: *Numerical approaches for structured population dynamics*;
24. 12-17/09/11, **XIX Congresso U.M.I.** (Bologna), CT: *Discretizzazione numerica di famiglie di evoluzione per equazioni differenziali con ritardo non autonome*;
25. 18-22/07/11, **ICIAM** (Vancouver), CT: in MS "Stability in delay differential equations": *On addressing stability for delay differential equations*;
26. 18-22/07/11, **ICIAM** (Vancouver), IT: in MS "Numerical analysis for delay differential equations": *Numerical discretization of evolution families for nonautonomous delay differential equations*;
27. 14-16/06/11, **Delay Differential Equations in Applications** (Vancouver), IS: *A numerical approach to the stability analysis of structured population dynamics*;
28. 22-26/05/11, **SIAM conference on Applications of Dynamical Systems** (Snowbird), CT: *Evolution families and Lyapunov exponents for retarded dynamical systems*;
29. 22-26/03/11, **workshop on New Developments in Dynamical Systems from Biosciences** (Columbus), IS: *Numerics for stability analysis of delay systems and population dynamics*;

30. 25/11/10, **workshop on Semigroups and Evolution** (IW, Udine), CT: *Numerical stability analysis of evolution models*;
31. 07-09/06/10, **6th IFAC Workshop on Time Delay Systems** (IW, Praga), CT: *On roots and charts of delay equations with complex coefficients*.
32. 07-09/06/10, **6th IFAC Workshop on Time Delay Systems** (IW, Praga), CP: *Characteristic roots of DDEs: is this the end?*
33. 03-05/06/09, **White Workshop on Mathematical Biology** (IW, Trento), CT: *Numerical stability analysis of structured population models*;
34. 12-16/10/09, **State-dependent delay equations** (IW, Dresda), IS: *Numerical computation of Lyapunov exponents for delay differential equations*;
35. 12-16/10/09, **State-dependent delay equations** (IW, Dresda), CP: *Characteristic roots of DDEs: is this the end?*
36. 07-09/09/09, **Delay differential equations: from theory to applications** (IW, Bristol), IS: *Numerical computation of Lyapunov exponents for delay differential equations*;
37. 03-05/06/09, **Trends in bifurcation analysis: methods and applications** (IW, Milano), CT: *Numerical computation of Lyapunov exponents for delay differential equations*;
38. 23-25/04/09, **Numerics of Dynamical systems** (IW, Helsinki), CT: *Numerical computation of Lyapunov exponents for delay differential equations*;
39. 15-17/12/08, **wANPE08: workshop on Analysis and Numerics of Population dynamics and Epidemics models** (IW, Udine), CT: *Stability analysis of the Gurtin-MacCamy model*;
40. 04-06/09/08, **IX SIMAI** (NC, Roma), IT in MS "Innovative Numerical Methods for Evolutionary Problems": *Numerical stability analysis of infinite-dimensional dynamical systems*;
41. 17-20/06/08, **Structural Dynamical Systems: computational aspects** (IW, Capitolo), CT: *Numerical stability analysis of infinite-dimensional dynamical systems*;
42. 13/06/08, **Seminar on Numerical Analysis and Geometric Integration** (IW, Ljubljana), CT: *Stability analysis of the Gurtin-MacCamy model*;
43. 04-06/02/08, **Convegno Nazionale GNCS** (NC, Montecatini Terme), CT: *Analisi di stabilità del modello di Gurtin-MacCamy*;
44. 01-05/11/07, **AARMS-CRM workshop on Recent Advances in Functional and Delay Differential Equations** (IW, Halifax), IS: *Computation of characteristic values for partial retarded functional differential equations*;
45. 16-20/07/07, **6th International Congress on Industrial and Applied Mathematics ICIAM** (IC, Zurigo), IT in MS "Nonlinear eigenvalue problems": *Pseudospectral computation of characteristic values for partial retarded functional differential equations*;
46. 17-19/04/07, **49th British applied mathematics colloquium** (IC, Bristol), IT: in MS "Delay equations": *Numerical computation of stability for time delay systems*;
47. 10-15/09/06, **Innovative integrators for differential and delay equations** (IW, Innsbruck), ITU: *Trace-DDE: Tool for Robust Analysis and Characteristic Equation of Delay Differential Equations*;
48. 10-15/09/06, **Innovative integrators for differential and delay equations** (IW, Innsbruck), CT: *An algorithm for efficient computation of level curves of surfaces*;
49. 10-12/07/06, **6th IFAC Workshop on Time Delay Systems** (IW, L'Aquila), IT: *Numerical computation of characteristic multipliers for linear time periodic coefficients delay differential equations*;
50. 09-10/06/06, **Convegno FIRB "Metodi dell'Analisi Matematica in Biologia, Medicina e Ambiente"** (NC, Montecatini Terme), CT: *Un metodo numerico per analizzare la dinamica del modello di Gurtin-MacCamy*;
51. 14-16/02/06, **Convegno Nazionale GNCS** (NC, Milano), CT: *Numerical approximation of characteristic multipliers of delay differential equations with time periodic coefficients*;
52. 12-16/12/05, **44th IEEE Conference on Decision and Control and European Control Conference CDC-ECC** (IC, Siviglia), IP: *Pseudospectral techniques for stability computation of linear time delay systems*;
53. 12-16/12/05, **44th IEEE Conference on Decision and Control and European Control Conference CDC-ECC** (IC, Siviglia), CT: *Complete stability depiction of first order neutral type multiple time delay systems*;
54. 24-28 09/05, **ASME International Design Engineering Technical Conferences & Computers and Information In Engineering Conference IDETC-CIE** (IC, Long Beach, California), IT: *Efficient computation of stability charts for linear time delay systems*;
55. 25/04/05, **One Day Workshop on Analysis and Computation of Lattice, Delay and Functional Differential Equations** (IW, Montreal), IT: *Pseudospectral approximation of eigenvalues of derivative operators with nonlocal boundary conditions*;
56. 22-24/11/04, **Modellistica e Calcolo Scientifico MOX** (NW, Bergamo), CT: *Metodi di differenziazione pseudospettrali per radici caratteristiche di dinamiche di popolazione con struttura*;



57. 18-21/05/04, **The Third International Conference on the Numerical Solution of Volterra and Delay Equations** (IC, Tempe, Arizona), CT: *Pseudospectral approximation of eigenvalues of derivative operators with non-local boundary conditions*;
58. 30/06-04/07/03, **Scientific computation and differential equations - SciCADE** (IC, Trondheim), CT: *Numerical computation of characteristic roots for delay differential equations*;
59. 26-29/06/02, **Conference on Scientific Computation** (IC, Ginevra), CT: *Numerical computation of characteristic roots for delay differential equations*;
60. 03-09/06/02, **BIOCOMP: Topics in biomathematics and related computational problems, the beginning of the third millennium** (IC, Vietri sul Mare), CP: *Numerical computation of characteristic roots for delay differential equations*;
61. 27-31/05/02, **VI SIMAI** (NC, Chia Laguna), CT: *Numerical computation of characteristic roots for delay differential equations*;
62. 08-10/12/01, **3rd IFAC workshop on Time delay systems** (IW, Santa Fe, New Mexico), CT: *Numerical computation of characteristic roots for delay differential equations*.

supervision indicated by “period, candidate: **title**, others”

#### PhD

1. XXXII cycle, A. Andò: **Collocation methods for complex delay models of structured populations**, PhD in Computer Science and Mathematics and Physics, supervisor;
2. XXX cycle, D. Liessi: **Pseudospectral methods for the stability of periodic solutions of delay models**, PhD in Computer Science and Mathematics and Physics, supervisor.

#### post-doc

1. 01/09/20-31/08/21, A. Andò: **Numerical Approximation and continuation of periodic orbits of delay systems and applications to population dynamics**, supervisor;
2. 01/04/18-31/03/19, D. Liessi: **Floquet theory for renewal equations and applications to population dynamics**, supervisor.

advanced courses indicated by “period, **course title**, school title (venue)”

1. 05/21, **Dynamical systems**, SUPE and PhD in Computer Science, Mathematics and Physics (Udine);
2. 05/21, **A primer on dynamics for systems biology**, PhD in Agriculture Science and Biotechnology (Udine);
3. 25-29/11/19, **Numerical stability analysis of delay equations**, CISM advanced school on Controlling Delayed Dynamics: Advances in Theory, Methods and Applications (Udine);
4. 07/19, **Periodic orbits of dynamical systems**, SUPE and PhD in Computer Science, Mathematics and Physics (Udine);
5. 27-29/08/18, **Numerical Stability Analysis for Delay Differential and Renewal Equations**, IRC Distinguished Lecture Series (Toronto);
6. 09-11/09/16, **Stability analysis with Matlab**, Szeged School on Computational Tools for Delay Differential Equations (Szeged);
7. 11-12/15, **Lyapunov exponents for ordinary differential equations: theory and computation**, PhD in Computer Science, Mathematics and Physics (Udine).

## TEACHING

university courses indicated by “academic year, **title**, degree course or school (venue, hours)”

- 2020/21:
  - **Dynamical systems**, SUPE and PhD in Computer Science, Mathematics and Physics (Udine, 10)
  - **Sistemi Dinamici Applicati**, LM-MAT (Udine, 48);
  - **Laboratorio di Matematica Computazionale**, LM-MAT (Udine, 24);
  - **Matematica e Statistica - Modulo I**, LT-BIO (Udine, 50);
- 2019/20:
  - **Sistemi Dinamici Applicati**, LM-MAT (Udine, 48);
  - **Laboratorio di Matematica Computazionale**, LM-MAT (Udine, 48);
  - **Matematica e Statistica - Modulo I**, LT-BIO (Udine, 50);

- 2018/19:
  - **Periodic orbits of dynamical systems**, SUPE and PhD in Computer Science, Mathematics and Physics (Udine, 20);
  - **Sistemi Dinamici Applicati**, LM-MAT (Udine, 48);
  - **Laboratorio di Matematica Computazionale**, LM-MAT (Udine, 48);
  - **Matematica e Statistica - Modulo I**, LT-BIO (Udine, 50);
- 2017/18:
  - **Sistemi Dinamici Applicati**, LM-MAT (Udine, 48);
  - **Laboratorio di Matematica Computazionale**, LM-MAT (Udine, 48);
  - **Matematica e Statistica - Modulo I**, LT-BIO (Udine, 50);
- 2016/17:
  - **Analisi Numerica 4**, LM-MAT (Udine, 16);
  - **Laboratorio di Matematica Computazionale**, LM-MAT (Udine, 48);
  - **Matematica e Statistica - Modulo I**, LT-BIO (Udine, 50);
- 2015/16:
  - **Laboratorio di Matematica Computazionale**, LM-MAT (Udine, 48);
  - **Lyapunov exponents for ordinary differential equations: theory and computation**, PhD in Computer Science, Mathematics and Physics (Udine, 24);
- 2014/15:
  - **Analisi Numerica 4**, LM-MAT (Udine, 16);
  - **Esercitazioni di Calcolo Scientifico**, LT-INF (Udine, 8);
  - **Esercitazioni di Matematica e Statistica**, LT-SAN and LT-VIT (Udine, 30);
- 2013/14:
  - **Laboratorio di Matematica Computazionale**, LM-MAT (Udine, 48);
  - **Esercitazioni di Analisi Numerica 2**, LM-MAT (Udine, 8);
  - **Esercitazioni di Analisi Numerica 3**, LM-MAT (Udine, 4);
  - **Esercitazioni di Matematica e Statistica**, LT-SAN e LT-VIT (Udine, 15);
- 2012/13:
  - **Analisi Numerica 2**, LM-MAT (Udine, 48);
  - **Analisi Numerica 4**, LM-MAT (Udine, 48);
- 2011/12:
  - **Laboratorio di Matematica Computazionale**, LM-MAT (Udine, 48);
  - **Esercitazioni di Analisi Numerica 2**, LM-MAT (Udine, 8);
  - **Esercitazioni di Analisi Numerica 3**, LM-MAT (Udine, 4);
- 2010/11:
  - **Algoritmi Numerici e Applicazioni**, LM-INF (Udine, 24);
  - **Laboratorio di Matematica Computazionale**, LT/LM-MAT (Udine, 24);
  - **Analisi Numerica 2**, LM-MAT (Udine, 24);
- 2009/10:
  - **High Performance Computing**, LM-INF (Udine, 24);
  - **Analisi Numerica 2**, LT/LM-MAT (Udine, 24);
- 2008/09:
  - **Laboratorio di Calcolo Numerico**, SSIS (Udine, 20);
  - **Analisi Numerica 4**, LM-MAT (Udine, 24);
  - **Calcolo Scientifico**, LT-INF (Udine, 6);
  - **Laboratorio di Calcolo Scientifico**, LT-INF (Udine, 20);
  - **Analisi Numerica 2**, LT/LM-MAT (Udine, 24);
- 2007/08:
  - **Analisi Numerica 4**, LM-MAT (Udine, 24);
  - **Analisi Numerica 3**, LM-MAT (Udine, 8);
  - **Analisi Numerica 2**, LT/LM-MAT (Udine, 8);
  - **Calcolo Scientifico**, LT-INF (Udine, 8);
  - **Laboratorio di Calcolo Scientifico**, LT-INF (Udine, 12);
- 2006/07:
  - **Laboratorio di Informatica 1**, LT-MAT (Udine, 10);
  - **Laboratorio di Calcolo Numerico 1 e 2**, SSIS-143 (Udine, 20);
  - **Laboratorio di Calcolo Scientifico**, LT-INF (Udine, 25);

- 2005/06:
  - **Laboratorio di Informatica 1**, LT-MAT (Udine, 10);
  - **Esercitazioni di Analisi Numerica 2**, LT/LM-MAT (Udine, 6);
  - **Laboratorio di Calcolo Scientifico**, LT-INF (Udine, 25);
- 2004/05:
  - **Laboratorio di Informatica 1**, LT-MAT (Udine, 10);
  - **Laboratorio di Calcolo Numerico 1 e 2**, SSIS (Udine, 20);
  - **Tirocinio di Informatica Applicata alla Statistica e all'Epidemiologia**, LT interateneo Udine/Trieste di Tecniche della Prevenzione nell'Ambiente e nei Luoghi di Lavoro (Udine, 26);
- 2003/04:
  - **Informatica per l'Epidemiologia 1**, Scuola di Specializzazione in Igiene e Medicina Preventiva (Udine, 12);
  - **Tirocinio di Informatica Applicata alla Statistica e all'Epidemiologia**, LT interateneo Udine/Trieste di Tecniche della Prevenzione nell'Ambiente e nei Luoghi di Lavoro (Trieste, 24);
  - **Esercitazioni di Analisi Numerica 2**, LT/LM-MAT (Udine, 2);
  - **Laboratorio di Calcolo Scientifico**, LT-INF (Udine, 20);
- 2003/04:
  - **Esercitazioni di Analisi Numerica 2**, LT/LM-MAT (Udine, 6);
  - **Laboratorio di Calcolo Scientifico**, LT-INF (Udine, 20);

**students' evaluation** outcome of MSc (LM) and BSc (LT) courses in charge indicated by "course a.y., score (n. questionnaires)": the score expresses the level of global satisfaction.

- Sistemi Dinamici Applicati 2019/20, -/4 ( $\leq 3$ )
- Laboratorio di Matematica Computazionale 2019/20, 4.0/4 (3)
- Matematica e Statistica modulo I 2019/20, 3.6/4 (41)
- Sistemi Dinamici Applicati 2018/19, -/4 ( $\leq 3$ )
- Laboratorio di Matematica Computazionale 2018/19, 3.6/4 (5)
- Matematica e Statistica modulo I 2018/19, 3.8/4 (13)
- Sistemi Dinamici Applicati 2017/18, -/4 ( $\leq 3$ )
- Laboratorio di Matematica Computazionale 2017/18, 4.0/4 (4)
- Matematica e Statistica modulo I 2017/18, 3.7/4 (44)
- Analisi Numerica IV 2016/17, 3.8/4 (5)
- Laboratorio di Matematica Computazionale 2016/17, 4.0/4 (6)
- Matematica e Statistica modulo I 2016/17, 3.5/4 (45)
- Laboratorio di Matematica Computazionale 2013/14, 3.8/4 (5)
- Analisi Numerica 2 2012/13, 3.7/4 (5)
- Laboratorio di Matematica Computazionale 2011/12, 8.8/10 (5)
- Analisi Numerica II 2010/11, 8.3/10 (6)
- Laboratorio di Matematica Computazionale 2010/11, 8.4/10 (10)
- Analisi Numerica II 2009/10, 9.0/10 (5)
- High Performance Computing 2009/10, 8.8/10 (12)
- Laboratorio di Calcolo Numerico 2008/09, 9.1/10 (7)
- Analisi Numerica IV 2008/09, 7.7/10 (3)
- Analisi Numerica II 2008/09, 8.5/10 (4)
- Laboratorio di Calcolo Numerico 2006/07, 9.2/10 (32)
- Laboratorio di Calcolo Numerico 2004/05, 6.8/10 (11)

**supervision** MSc (LM) and BSc (LT) theses indicated by "a.y., candidate: **title**, degree course, role"

1. 2019/20, S. De Reggi: **Bivariate collocation methods for computing the basic reproduction number of population dynamics with double structure**, LM-MAT, advisor;
2. 2017/18, M. Gambone: **Applicazioni della differenziazione automatica al calcolo di equilibri di sistemi dinamici**, LT-MAT, advisor;
3. 2017/18, A. Lanza: **Alternating direction implicit methods for option pricing**, LM-MAT, advisor;
4. 2017/18, F. Florian: **Numerical computation of the basic reproduction number in population dynamics**, LM-MAT, advisor;

5. 2016/17, G. Gava: **Behavioral epidemiology: how past information affects vaccinating behaviours**, LM-MAT, advisor;
6. 2016/17, M. Meinero: **Modeling of industrial processes for control and optimization**, LM-MAT, advisor;
7. 2016/17, T. Erjavec: **Riemannian manifolds and tangent spaces: application to human activity recognition**, LM-MAT, co-advisor;
8. 2015/16, S. Busato: **Automatic differentiation and applications to financial problems**, LM-MAT, advisor;
9. 2015/16, M. Nonino: **On a special characteristic equation and its application to structured populations**, LM-MAT, advisor;
10. 2014/15, G. Menegon: **On characteristic roots of delay differential equations**, LM-MAT, advisor;
11. 2013/14, S. Della Schiava: **Computation of Lyapunov coefficients for differential equations**, LM-MAT, advisor;
12. 2012/13, D. Liessi: **A model for the dynamics of the impact between hammer and string in the grand piano**, LM-MAT, co-advisor;
13. 2012/13, V. Busoni: **Pseudospectral approaches for approximating retarded functional differential equations**, LM-MAT, advisor;
14. 2012/13, C. Narduzzi: **Efficient determination of the stability of equilibria for delay differential equations**, LM-MAT, advisor;
15. 2010/11, R. Mauro: **Chebfun: radici di polinomi e autovalori**, LT-MAT, advisor;
16. 2009/10, P. Osgnach: **Raffinamento adattativo per la compressione di immagini**, LM-INF, advisor;
17. 2009/10, A.M. D'ambrosio: **Teoremi di Perron e Frobenius e algoritmi di ranking**, LT-MAT, co-advisor;
18. 2009/10, C. Narduzzi: **Wavelets e analisi multirisoluzione**, LT-MAT, advisor;
19. 2007/08, A. Paussa: **Metodi pseudo-spettrali per la simulazione numerica di dispositivi nanoelettronici**, LM-ING, co-advisor.
20. 2004/05, D. Sechi: **Sviluppo di interfaccia grafica per lo studio della stabilità di sistemi differenziali con ritardo**, LT-INF, co-advisor.

### THIRD MISSION

**schools** indicated by "period, **title** (institute, venue)"

**PLS** Progetto Lauree Scientifiche

1. 13-20-27/01/20, **Dalla bisezione ai frattali di Newton** (laboratory, ITIS Magrini-Marchetti, Gemona del Friuli);
2. 12-19/12/19, **Dalla bisezione ai frattali di Newton** (laboratory, ITIS Malignani, Udine);
3. 06/12/19, **...ma quanto vale  $\sqrt{5}$ ?** (conference, ITIS Malignani, Udine);
4. 05/12/19, **...ma quanto vale  $\sqrt{5}$ ?** (conference, ITIS Magrini-Marchetti, Gemona del Friuli);
5. 31/10/19, interview Radio Rai-FVG "A tutto bit 3.0" on delay systems;
6. 08/02-15/02/19, **Dalla bisezione ai frattali di Newton** (laboratory, ITIS Malignani, Udine);
7. 21/12/18, **...ma quanto vale  $\sqrt{5}$ ?** (conference, ITIS Malignani, Udine);
8. 06-09/03/18, **Dalla bisezione ai frattali di Newton** (laboratory, LSS da Vinci, Univ. Udine);
9. 26/01-02/02/18, **Dalla bisezione ai frattali di Newton** (laboratory, ITIS Malignani, Udine);
10. 23/01/18, **...ma quanto vale  $\sqrt{5}$ ?** (conference, LSS da Vinci, Treviso);
11. 15/02/17, **...ma quanto vale  $\sqrt{5}$ ?** (conference, ITIS Malignani, Udine);
12. 24,27,31/01/12, **Equazioni lineari e matrici: la matematica in rete** (laboratory, ITC Zanon, Udine);
13. 09/01/12, **"scusi prof...ma a cosa servono le equazioni?!"** (conference, ITC Zanon, Udine);
14. 04,12/05/11, **Dalla bisezione ai frattali di Newton** (laboratory, ITI Malignani, Udine);
15. 05/04/11, **...ma quanto vale  $\sqrt{5}$ ?** (conference, ITI Malignani, Udine);
16. 08,15/02/11, **Dalla bisezione ai frattali di Newton** (laboratory, ITI Malignani - LS Le Filandiere, Udine);
17. 26/01,03/02/11, **Equazioni lineari e matrici: la matematica in rete** (laboratory, ITC Zanon - LS Le Filandiere, Udine);
18. 11/01/11, **Dal mattone a Google: equazioni ovunque** (conference, ITC Zanon, Udine);
19. 21/12/10, **...ma quanto vale  $\sqrt{5}$ ?** (conference, ITI Malignani, Udine);
20. 06/12/10, **Dal mattone a Google: equazioni ovunque** (conference, LS Le Filandiere, San Vito al Tagliamento);

21. 06/12/10, **...ma quanto vale  $\sqrt{5}$ ?** (conference, LS Le Filandiere, San Vito al Tagliamento);
22. 29-31/03,01/04/10, **“Mi sento fortunato”:** **matrici e sistemi dietro il WWW** (laboratory, ITC Zanon, Udine);
23. 16,22/03/10, **scusi prof...ma a cosa servono le equazioni?!** (conference, ITC Zanon, Udine);
24. 20/05/09, **Bisezione e metodo di Newton** (laboratory, ITI Malignani, Udine);
25. 04/05/09, **“Pronto, chi parla?” ovvero dalla Formula di Eulero al telefono a toni** (conference, ITI Malignani, Udine);
26. 16/04/09, **...ma quanto vale  $\sqrt{5}$ ?** (conference, ITI Malignani, Udine);
27. 23-27/03/09, **Matrici e applicazioni** (laboratory, ITC Zanon, Udine);
28. 26/02/09, **La matematica in rete: cosa c'è dietro Google** (conference, ITC Zanon, Udine);
29. 10/05/07, **La matematica in rete: cosa c'è dietro Google** (conference, ISIS Solari, Tolmezzo);
30. 1/10/03, **Introduzione ai sistemi con ritardo e determinazione numerica della stabilità**, seminar in the course “Metodi numerici per le equazioni differenziali ordinarie - Parte II” of PhD in Computational Mathematics (Univ. Padova), R. Vermiglio (Univ. Udine).

All PLS activities supported by the following projects, indicated by “**title** period, local coordinator (institution)”

1. **Piano Nazionale Lauree Scientifiche 2019-2021**, F. Zucconi (Univ. Udine);
2. **Piano Nazionale Lauree Scientifiche 2016-2018**, G. Gorni (Univ. Udine);
3. **Piano Nazionale Lauree Scientifiche 2010-2012**, R. Vermiglio (Univ. Udine);
4. **Progetto Lauree Scientifiche 2005-2009**, E. Toppano (Univ. Udine).

#### Talks-UNIUD

1. 03/02/21, **scusi prof...ma a cosa servono le equazioni?!** (Liceo Leopardi – Majorana, Pordenone);
2. 26/01/21, **scusi prof...ma a cosa servono le equazioni?!** (Liceo Stellini, Udine);
3. 18/01/20, **scusi prof...ma a cosa servono le equazioni?!** (ITIS Pujati, Sacile);
4. 19/12/19, **scusi prof...ma a cosa servono le equazioni?!** (ITIS Copernico, Udine);
5. 12/12/19, **scusi prof...ma a cosa servono le equazioni?!** (ITIS Bearzi, Udine);
6. 14/02/19, **scusi prof...ma a cosa servono le equazioni?!** (ITIS Bearzi, Udine).

- others**
1. Department commission for web site development and maintenance, representative for Mathematics/Physics, since 2018;
  2. 31/10/19 interview “A tutto bit 3.0” Radio RAI FVG on **systems with delays**, (podcast on-line).

## INTERNATIONALIZATION

**Erasmus** coordinator of the exchanges indicated by “foreign university (country), period, area: degrees”

1. Universidad de Valladolid (E), since 2020/21, mathematics: BSc, MSc, PhD;
2. Bolyai Institute Szeged University (H), since 2020/21, mathematics: BSc, MSc, PhD.

- others**
1. MOU with York University (CAN):
    - agreement on research in collaboration with Jianhong Wu, LIAM;
    - agreement on students’ exchange (2 incoming 2019/20).
  2. proposer Erasmus+ Key Action 107, area Canada:
    - 2018/19: positively evaluated (90/100), not admitted for restricted funds;
    - 2019/20: positively evaluated (82.5/100), not admitted for restricted funds.



## COMMITTEES – MEMBERSHIPS

- scientific committees**
1. IFAC Technical Committee 2.2 “Linear Control Systems” – Working Group “Time Delay Systems”, 2020-;
  2. International Program Committee **16th IFAC workshop on time delay systems** (Guangzhou, 29/09-01/10/21);
  3. organizing/scientific committee **Dobbiaco Summer School 2020 on Numerical Methods for Kinetic Equations** postponed to 2022, (Dobbiaco);
  4. coordinator **CISM advanced school on Controlling Delayed Dynamics: Advances in Theory, Methods and Applications** 25-29/11/19, (Udine);
  5. International Program Committee **15th IFAC workshop on time delay systems** (Sinaia, 09-11/09/19);
  6. International Program Committee **14th IFAC workshop on time delay systems** (Budapest, 28-30/06/18);
  7. International Program Committee **13th IFAC workshop on time delay systems** (Istanbul, 22-24/06/16);
  8. International Program Committee **12th IFAC workshop on time delay systems** (Ann Harbor, 28-30/06/15);
  9. co-organization **ECC Workshop on Time Delay Systems - Stability & Control in Applications** (Zurich, 16/07/13);
  10. International Program Committee **10th IFAC workshop on time delay systems** (Boston, 22-24/06/12);
  11. co-organization of minisymposium **7th International Congress on Industrial and Applied Mathematics ICIAM** (Vancouver, 18-22/07/11);
  12. organization of minisymposium **SIAM Conference on Applications of dynamical systems** (Snowbird, 22-26/05/11);
  13. co-organization of invited session **9th IFAC workshop on time delay systems** (Praga, 07-09/06/10);
  14. International Program Committee **9th IFAC workshop on time delay systems** (Praga, 07-09/06/10);
  15. co-organization of **wANPE08: workshop on Analysis and Numerics of Population dynamics and Epidemics models** (Udine, 15-17/12/08).
- evaluation committees**
1. defense École Doctorale Sciences et Technologies de la information et de la communication, Univ. Paris-Saclay 2021;
  2. defense PhD in Computer Science, Mathematics and Physics, Univ. Udine, 2020;
  3. admission PhD in Computer Science, Mathematics and Physics, Univ. Udine, 2020;
  4. mid-term evaluation École Doctorale Sciences et Technologies de la information et de la communication, Univ. Paris-Saclay 2020;
  5. admission PhD in Mathematical Analysis, Modelling and Applications, SISSA, March 2019;
  6. defense PhD in Mathematical Analysis, Modelling and Applications, SISSA, September 2018;
  7. admission PhD in Mathematical Analysis, Modelling and Applications, SISSA, September 2018;
  8. admission PhD in Computer Science, Mathematics and Physics, Univ. Udine, 2017;
  9. admission PhD in Mathematics and Physics, Univ. Udine, 2012;
  10. admission PhD in Mathematics and Physics, Univ. Udine, 2010;
  11. SSIS final examination, Univ. Udine, 2007/08 and 2008/09.
- institutional committees**
1. commissione ricerca, Department of Mathematics, Computer Science and Physics, Univ. Udine, 2020-;
  2. commissione pianificazione Lauree Matematica, Department of Mathematics, Computer Science and Physics, Univ. Udine, 2020-;
  3. GEV candidate, area 01, 2020: selected, not extracted;
  4. commissione assicurazione qualità - ricerca e terza missione, Department of Mathematics, Computer Science and Physics, Univ. Udine, 2018-;
  5. commissione sito web, Department of Mathematics, Computer Science and Physics, Univ. Udine, 2018-;
  6. PhD in Computer Science and Mathematics and Physics, Univ. Udine, 2015- – vice-coordinator, 2015-2019;
  7. PhD in Mathematics and Physics, Univ. Udine, 2010-2015;
  8. Giunta Dipartimento di Matematica e Informatica, Univ. Udine, 2009-2012, 2012-2015.

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projects evaluations referee of several proposals from

1. ERC
2. EU countries
3. non-EU countries

- memberships
1. U.M.I. research group "Modellistica socio-epidemiologica", co-founder and elected member of the board 2020-;
  2. Società Italiana Caos e Complessità (SICC), 2009-2013 and 2019-;
  3. Computational Dynamics Laboratory (CDLab), 2017-;
  4. Unione Matematica Italiana (U.M.I.), 2015-;
  5. Biological Modelling and Scientific Computing Trento (BioMaSCoT), 2006-07;
  6. E-Delay Control Letters, 2006-;
  7. Numerical Analysis Group, 2001-;
  8. INdAM/GNCS, 2001-.

## PUBLICATIONS

All peer-reviewed except for internal reports

- submitted
1. Andò A. and Breda D., *Numerical computation of periodic solutions of renewal equations from population dynamics*;
  2. Breda D., De Reggi S., Scarabel F., Vermiglio R. and Wu J., *Bivariate collocation for computing  $R_0$  in epidemic models with two structures*.

- monographs
1. Breda D., Maset S. and Vermiglio R., *Stability of linear delay differential equations - A numerical approach with Matlab*, SpringerBriefs in Control, Automation and Robotics, Springer, New York, 2015, DOI: 10.1007/978-1-4939-2107-2.

- journals
1. Ramirez A., Breda D. and Sipahi R., *A Scalable Approach to Compute Delay margin of a Class of Neutral-type Time Delay Systems*, Siam J. Control Optim., to appear;
  2. Breda D., Kuniya T., Ripoll J. and Vermiglio R., *Collocation of next-generation operators for computing the basic reproduction number of structured populations*, J. Sci. Comput., 85(40), 2020, DOI: 10.1007/s10915-020-01339-1;
  3. Andò A. and Breda D., *Convergence analysis of collocation methods for computing periodic solutions of retarded functional differential equations*, SIAM J. Numer. Anal., 58(5):3010-3039, 2020, DOI: 10.1137/19M1295015, full version on <https://arxiv.org/abs/2008.07604>;
  4. Andò A., Breda D. and Gava G., *How fast is the linear chain trick? A rigorous analysis in the context of behavioral epidemiology*, Math. Biosci. Eng., 17(5):5059-5084, 2020, DOI: 10.3934/mbe.2020273;
  5. Breda D., Florian F., Ripoll J. and Vermiglio R., *Efficient numerical computation of the basic reproduction number for structured populations*, J. Comp. Appl. Math, 384, 113165, 2021, DOI: 10.1016/j.cam.2020.113165;
  6. Breda D. and Liessi D., *Approximation of eigenvalues of evolution operators for linear coupled renewal and retarded functional differential equations*, Ric. Mat, 2020, DOI: 10.1007/s11587-020-00513-9;
  7. Scarabel F., Breda D., Diekmann D., Gyllenberg M and Vermiglio R., *Numerical bifurcation analysis of physiologically structured population models via pseudospectral approximation*, Vietnam J. Math., 2020, DOI: 10.1007/s10013-020-00421-3;
  8. Breda D. and Liessi D., *Floquet theory and stability of periodic solutions of renewal equations*, J. Dynam. Differential Equations, 2020, DOI: 10.1007/s10884-020-09826-7;
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SIGNATURE

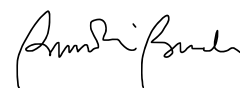
Autorizzo il trattamento dei miei dati personali, ai sensi del D. lgs. 196 del 30 giugno 2003.



Dimitri Breda

Pradamano, February 21, 2021

Il sottoscritto Dimitri Breda, consapevole che le dichiarazioni false comportano l'applicazione delle sanzioni penali previste dall'art. 76 del D. P. R. 445/2000, dichiara che le informazioni riportate nel presente curriculum vitae, redatto in formato Europass, corrispondono a verità.



Dimitri Breda

Pradamano, February 21, 2021