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Annalisa Buffa

Curriculum Vitae

Lausanne, August 2018

Research interests

Main research field: numerical analysis, discretization of partial differential equations.
Main keywords: Isogeometric analysis, fully compatible discretization of PDEs, linear and non linear elasticity, contact mechanics, integral equations on nonsmooth manifolds, functional theory for Maxwell equations in non-smooth domains, finite element techniques for Maxwell equations, non-conforming domain decomposition methods, asymptotic analysis, stabilization techniques for finite element discretizations.

Current position

09/2016– **Full Professor, Chair of Numerical Modeling and Simulation**, *Institute of Mathematics*, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland.

2004– **Research Director (on leave since 09/2016)**, *Istituto di Matematica Applicate e Tecnologie Informatiche "E. Magenes"*, Consiglio Nazionale delle Ricerce (CNR), Pavia.

2013-2019 **Habilitated as full professor in numerical analysis by the Italian ASN**.

Previous positions and research experiences

2004-2016 **Research Director**, *Istituto di Matematica Applicate e Tecnologie Informatiche "E. Magenes"*, Consiglio Nazionale delle Ricerce (CNR) , Pavia.

2013-2016 **Director of the *Istituto di Matematica Applicate e Tecnologie Informatiche "E. Magenes"***, *Consiglio Nazionale delle Ricerce (CNR)*, Italy.
Pavia, Milano, Genova sections - about 70 employees

Fall 2005 **Invited researcher**, *Institute for Computational Engineering and Sciences (ICES), University of Texas at Austin*, USA, (3 months).
Tinsley Oden Faculty Fellowship Research Program

Fall 2004 **Invited researcher**, *Institute for Computational Engineering and Sciences (ICES), University of Texas at Austin*, USA, (2 months).
Tinsley Oden Faculty Fellowship Research Program

Spring 2004 **Invited professor**, *Laboratoire J.L. Lions, Université Pierre et Marie Curie*, Paris, France, (7 months).

2001-2004 **Researcher**, *Istituto di Matematica Applicate e Tecnologie Informatiche "E. Magenes"*, Consiglio Nazionale delle Ricerce (CNR), Pavia.

2002-2003 **Invited researcher**, *Centre de Mathématiques Appliquées, École Polytechnique*, Palaiseau, France, (1 year).

Spring 2002 **CNRS researcher**, *Laboratoire d'Analyse Numèrique, Université Pierre et Marie Curie*, Paris, France, (6 months).

2001 **Post-Doctoral Fellow**, *Seminar für Angewandte Matematik, ETH*, Zürich, Switzerland, (9 months).

I was invited for short visits to numerous Universities during the last years. Among others: Aachen, Mc-Gill Montreal, CMA Oslo, Cambridge, Max-Planck Institute Leipzig, University of Zürich, ETH-Zürich, Techincal University of Munich, WIAS Berlin, IMA Minneapolis ...

Education

2000 **Ph.D in Mathematics**, *University of Milano*, Italy.
Title: Some numerical and theoretical problems in computational electromagnetism.
Advisor: F. Brezzi

1996 **M.Sc. in Computer Science Engineering**, *University of Pavia*, Italy,
GRADE: 110/110 cum laude and honors.
Title: Filtraggio di immagini e problemi di evoluzione non lineare.
Advisor: F. Brezzi

Awards and special lectures

2018- Corresponding member of the Accademia dei Lincei

2016- Member of the Academia Europaea

08/2015 **Collatz prize** by ICIAM, `http://www.iciam.org/council/node7_ct.html`

11/2014 The **Aziz Lecture**, Department of Mathematics, University of Maryland, USA

5/2014 **Premio Sgarlata**, nomination of the president of CNR, Luigi Nicolais

10/2013 **Premio Ghislieri** for mathematical sciences.

09/2007 **Bartolozzi** Prize, *Unione Matematica Italiana*.

02/2007 **John Todd Fellowship** Prize, Mathematisches Forschungsinstitut, Oberwolfach, Germany.

1991-2000 During my studies, I was awarded a number of fellowships by e.g., Istituto Lombardo Accademia di Scienze e Lettere and SIMAI (Italian Society of Applied and Industrial Mathematics) and I was a fellow of Collegio Ghislieri.

ERC grants

2016-2020 **ERC Advanced Research Grant**, awarded by the European Research Council for the project CHANGE: *New CHallenges for (adaptive) PDE solvers: the interplay of ANalysis and GEometry* .

2009-2014 **ERC Starting Independent Research Grant**, awarded by the European Research Council for the project GeoPDEs: *Innovative compatible discretization techniques for Partial Differential Equations*.

Interviews and press

2016 Repubblica

2014 Avvenire

2013 D di Repubblica, Rai 3, Il Giorno, il Corriere della Sera

2011 Espresso, *Scienziati 10 e Lode*

2011 Twist Project: *Towards Women in Science and Technology*, Fondazione Idis-Città della Scienza, Napoli

2011 Italia oggi

Plenary lectures

2018 **The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications**, Taipei, Taiwan, July.

2016 **Bi-annual congress of the Italian Society of Industrial and Applied Mathematics (SIMAI)**. Milano, September

2016 **The European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS)**.
Semi-plenary speaker, Crete, Greece, June

2015 **8th International Congress on Industrial and Applied Mathematics (ICIAM 2015)**.
Beijing, China, August

2014 **Foundations of Computational Mathematics conference (FoCM)**.
Montevideo, Uruguay, December

2014 **International Congress of Mathematicians (ICM)**.
45 minutes lecture, Section 15, Seoul, South Corea, August

2014 **GAMM Annual Meeting**.
Erlangen-Nuremberg, Germany, March

2013 **The Mathematics of Finite Elements and Applications (MAFELAP)**.
Brunel University, London, UK, June

2013 **14th International Conference on Approximation Theory**.
San Antonio, Texas, April

2012 **The European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS)**.
Semi-plenary speaker, Vienna, Austria, September

2010 **Curves and Surfaces**.
Avignon, France, June

2010 **Third Chilean Workshop on Numerical Analysis of Partial Differential Equation**.
Concepcion, Chile, January

2009 **23rd Biennial Numerical Analysis Conference**.
Glasgow, UK, July

2009 **SMAI Conference**.
Colle de Loup, Nice, France, May

2008 **Fifth European Congress of Mathematics**.
"Invited parallel lecture" (45 minutes), Amsterdam, The Netherlands, June

2007 **XVIII Congress of Unione Matematica Italiana**.
Bari, Italy, September

2007 **8th International Conference on Mathematical and Numerical Aspects of Waves (WAVES)**.
Reading, UK, July

2007 **International Conference on Scientific Computation And Differential Equations (SciCADE)**.
Saint-Malo, France, June

2005 **XIX Congreso de ecuaciones diferenciales y aplicaciones (CEDYA)**.
Madrid, Spain, April

2005 **The European Conference on Numerical Mathematics and Advanced Applications (ENUMATH)**.
Santiago de Compostela, Spain, July

2001 **GAMM-Workshop: Computational electromagnetics**.
Kiel, Germany, October

2000 **Convegno RIFORMA**.
Genova, Italy, May

1999 **Twelve International Conference on Domain Decomposition (DD12)**.
Chiba, Japan.

Invited lectures and seminars

Invited Lectures in Workshops and Colloquia

2017 **Stepping Stone symposium on Theoretical and Numerical Analysis of PDEs**.
Université de Geneve, Switzerland

2017 **MFET: Modern Finite Element Technologies**.
Bad Honnef, Germany

2014 **The Aziz Lecture, Department of Mathematics**.
University of Maryland

2014 **Conference on Numerical Analysis and Scientific Computing**.
Max Planck Institute for Mathematics, Leipzig, Germany

2013 **Swiss Numerical Analysis Colloquium**.
Lausanne, Switzerland.

2013 **Computational Electromagnetism**.
Mathematisches Forschungsinstitut, Oberwolfach, Germany

2012 **High-Order Numerical Approximation for Partial Differential Equations**, workshop, Bonn, Germany.

2011 **Higher Order Finite Element and Isogeometric Methods (HOFEIM)** .
Cracow, Polland, June.

2011 **Journées Lions-Magenes**.
UPMC Paris, France.

2011 **Foundations of Numerical PDEs**.
within the FoCM Conference, Budapest, Hungary.

2009 **Compatible and innovative discretizations for PDEs**.
a workshop on the occasion of Ragnar Winther's 60th birthday, Oslo, Norway.

2007 **High-order methods for computational wave propagation and scattering**.
AIM Research Conference Center (ARCC), Palo Alto, California.

2007 **Computational Electromagnetism and Acoustics**.
Mathematisches Forschungsinstitut, Oberwolfach, Germany.

2006 **Advances in Computational Scattering**.
Birs Symposium: Banff, Alberta, Canada.

2005 **International Conference on Electromagnetics in Advanced Applications**.
Invited Session *Computation Electromagnetics*, Turin, Italy.

2005 **New trends in Simulation and Control of PDEs**.
WIAS Institute, Berlin, Germany.

2004 **Computational Electromagnetism**.
Mathematisches Forschungsinstitut, Oberwolfach, Germany.

2002 **New trends in boundary elements**.
Mathematisches Forschungsinstitut, Oberwolfach, Germany.

2002 **Analytical and numerical treatment of singularities in partial differential equations**.
Mathematisches Forschungsinstitut, Oberwolfach, Germany.

2002 **Problems in electromagnetism**.
Università degli Studi di Trento, Italy.

2000 **Colloquium *CRESPO*** .
ENSTA-INRIA, Paris, France.

1999 **Domain decomposition and multifields theories**.
Mathematisches Forschungsinstitut, Oberwolfach, Germany.

Invited seminars (incomplete list)

2017 Max-Planck Institute of Mathematics in the Sciences, Leipzig

2016 TU Berlin, Department of Mathematics

2015 Dipartimento di Matematica, Università di Firenze

2015 Ecole Polytechnique Fédérale de **Lausanne**

2014 ICES, University of Texas at **Austin**.

2014 TU of **Darmstadt**, Germany.

2012 Robert Bosch GmbH, Corporate Research, **Stuttgart,** Germany.

2012 Universität **Zürich**, Institut für Mathematik, Switzerland.

2011 Seminar für Angewandte Matematik, ETH, **Zürich**, Switzerland.

2009 INRIA, **Rocquencourt**, France.

2009 Laboratoire Jacques Louis Lions, **Paris**, France.

2008 Department of Mathematics, **Penn State** University, USA.

2008 Institut für Geometrie und Praktische Mathematik, RWTH **Aachen**, Germany.

2006 School of Mathematics, University of Minnesota, **Minneapolis**, USA.

2006 Department of Mathematics and Statistics, McGill University, **Montreal**, Canada.

2005 Department of Applied Mathematics and Theoretical Physics Centre for Mathematical Sciences, University of **Cambridge**, England.

2005 Electrical Engeneering Department, Università degli Studi di **Pisa**, Italy.

2005 Centre of Mathematics for Applications, University of **Oslo**, Norway.

2004 Universität **Zürich**, Institut für Mathematik, Switzerland.

2004 Centre of Mathematics for Applications, University of **Oslo**, Norway.

2003 ICES Institute for Computational Engineering and Sciences, University of Texas at **Austin.**

2003 Laboratoire Jacques-Louis Lions, Université Pierre et Marie Curie, **Paris**, France.

2002 Institut für Geometrie und Praktische Mathematik, RWTH **Aachen**, Germany.

2002 CERMICS, **Marne-la-Vallée**, France.

2002 Laboratoire Jacques-Louis Lions, Université Pierre et Marie Curie, **Paris**, France.

2001 Dipartimento di Matematica, Università degli studi di **Trento**, Italy.

1999 Seminar für Angewandte Matematik, ETH, **Zürich**, Switzerland.

1999 Mathematisches Institut, Universität **Tübingen**, Germany.

1999 École Polytechnique Fédérale de **Lausanne**, Switzerland.

1998 Mathematisches Institut, Universität **Augsburg**, Germany.

Teaching

Undergraduate and M.Sc. level

2018 Lecturer, *EPFL*, Course: "Numerical Methods for Saddle Point Problems", M.Sc.

2018 Lecturer, *EPFL*, Course: "Analyse Numèrique", for mathematics, Bachelor

2017 Lecturer, *EPFL*, Course: "Analyse I" for mechanical engineering, Bachelor

2017 Lecturer, *EPFL*, Course: "Numerical methods for electromagnetics", M.Sc .

2017 Lecturer, *EPFL*, Course: "Analyse Numèrique" , for mechanical engineering, Bachelor.

2016 Lecturer, *EPFL*, Course: "Analyse I" for electrical engineering, Bachelor.

2010 Lecturer, *Università degli Studi di Pavia, science faculty*, Course: "Calcolo Numerico per le scienze chimiche" for students in chemistry.

2009 Lecturer, *Università degli Studi di Pavia, science faculty*, Course: "Calcolo Numerico per le scienze chimiche" for students in chemistry.

2007 Lecturer, *Università degli Studi di Pavia, science faculty*, Course: "Istituzioni di Matematiche" for students in biology.

2006 Lecturer, *Università degli Studi di Pavia, science faculty*, Course: "Istituzioni di Matematiche" for students in biology.

2004 Lecturer, *Université Pierre et Marie Curie, Paris VI*, Course: DEUG SCM13 "Algèbre".

2001 Head Assistant, *Seminar für Angewandte Matematik*, ETH, Zürich, Switzerland. Course: Linear Algebra.

1996-2000 Head Assistant, *Università degli Studi di Pavia, Engineering school*, Pavia, Italy. One course per year: Calculus A, Calculus B.

Lectures in Ph.D. schools and courses

2015 CEA-EDF-INRIA School on "New Trends in Compatible Discretizations", Paris, France.

2012 Isogeometric compatible discretizations, CIME Summer School, Cetraro Italy.

2011 Mixed finite elements: theory and applications, Ph.D course, Department of Mathematics, Pavia, joint with C. Lovadina.

2010 Elementi di Calcolo Esterno Discreto, Ph.D. course, Department of Mathematics, Pavia

2004 Domain decomposition techniques for elliptic problems, Ph.D. course, Department of Mathematics, Pavia

2003 Boundary integral equation methods for the Maxwell equations, Ph.D. Course, Institut für Angewandte Analysis und Numerische Simulation, Stuttgart

2001 Time harmonic Maxwell Equations: theory and numerics, Ph.D. and M.Sc. course, Seminar für Angewandte Matematik, ETH, Zürich, Switzerland.

Student advising

Ph.D. Students

2017- Ondine Chanon, Thesis subject: *Adaptive isogeometric analysis* , EPFL, Ecole Doctoral Mathématiques, starting September 2017.

2017- Luca Coradello, Thesis subject: *Isogeometric analysis for layered anisotropic thick shells*, EPFL, Ecole Doctoral Mechanique, started February 2017.

2016- Riccardo Puppi, Thesis subject: *Isogeometric analysis on trimmed domains*, EPFL, Ecole Doctoral Mathématiques, started December 2016.

2012- Linus Wunderlich, Thesis subject: *High order contact mechanics*, Technische Universität München. First advisor: B. Wohlmuth.

2012- Ericka Brivadis, Thesis subject: *Isogeometric contact mechanics*, Istituto Universitario di Studi Superiori, Pavia, Italy. In collaboration with Michelin, Centre de Technologies de Ladoux, France.

2009-2013 Andrea Bressan. Thesis subject: *Isogeometric methods for saddle point problems*, Università degli Studi di Pavia. Co-advisor: Giancarlo Sangalli. Now post-doc at at the University of Oslo.

2003-2009 Paola Antonietti. Thesis subject: *Domain Decomposition techniques and Preconditioning for the Discontinuous Galerkin method*, Università degli Studi di Pavia. Co-advisor: Ilaria Perugia. Now associate professor at Politecnico di Milano

Post doctoral students

Since 2015 Mathieu Fabre. *Isogeometric algorithms for contact mechanics*

Since 2015 Federico Marini. *Mortar methods for non linear mechanics*

2016-2017 Hongmei Kang. *Trimming and multipatch implementation and testing*. Now assistant professor at the Nakai University

2014-2015 Eduardo Garau. *Adaptive hierarchical spline methods*. Assistant professor, University of Santa Fe, Argentina

Since 2013 Pablo Antolín. *Isogeometric analysis for large deformations*.

2012-2013 Sebastian Pauletti. *Geometric equations via Isogeometric Analysis*. Now assistant professor, University of Santa Fe, Argentina

2010-2014 Massimiliano Martinelli. *Development of a C++ Isogeometric Code*. Now "tecnologo" (equiv. to researcher) at IMATI-CNR

2008-2011 Rafael Vàzquez. *Isogeometric analysis in electromagnetics*. Now researcher at IMATI-CNR

2008-2010 Durkbin Cho. *The use of T-splines in isogeometric analysis*. Now assistant professor at the Dongguk University, Seoul

2009-2010 Carlo De Falco. *Isogemetric analysis for saddle point problems*. Now researcher at Politecnico of Milano

2009-2010 Mukesh Kumar. *Computation aspects of Isogemetric analysis*. Now post-doc in SINTEF, Norway

Professional activities

Editorial activity

Since 2015 SIAM Journal Numerical Analysis, Editor

2014-2017 JEMS Journal of the European Mathematical Society, Editor.

Since 2014 Book series: EMS Series in Industrial and Applied Mathematics, Editor.

Since 2013 ESAIM: Mathematical Modelling and Numerical Analysis, **Editor In-Chief**.

Since 2008 Bollettino dell'Unione Matematica Italiana, Associate Editor.

Since 2007 IMA Journal of Numerical Analysis, Associate Editor.

Participation to committees

Since 2016 Member of the scientific board for the ECCOMAS thematic conference, Modern Finite Element Technologies - Mathematical and Mechanical Aspects"

Since 2015 Member of the scientific committee for the ICOSAHOM Conferences

Since 2015 Member of the scientific committee for Fondation Sciences Mathématiques de Paris (FSMP)

Since 2014 Member of the scientific committee for the PhD program in Mathematics and Statistics, Università di Pavia

2014-2016 Member of the **scientific committee, 7th European Congress of Mathematics (7ECM).**

Since 2014 Member of the scientific committee for the doctoral school in Mathematics, University of Pavia

2013-2014 Member of the ENGITECH Committee, *Science Europe*.

2013-2014 Member of the Scientific Committee for the Curves and Surfaces, Paris, June 2014.

Since 2012 Member of the Scientific Committee for the WAVE Conferences

2012-2013 Member of the Scientific Committee for the ENUMATH Conference, EPFL, Lausanne, August 2013.

Since 2011 **Member-at-large of the Board of Directors of FoCM,** Foundation of Computational Mathematics.

2010-2014 Member of the teaching committee of the I.U.S.S. Ph.D. program "Computational mechanics and advanced materials".

2011 Member of the Conference Committee of the 15th International Symposium on Applied Electromagnetics and Mechanics, Naples.

2010-2016 **Member of Standing Committee on Applied Mathematics of EMS.**

2009 Member of the evaluation panel for *Mathematics and ...*, Vienna Science and Technology Fund.

2008-2012 Member of the Scientific Users Committee (SCUC) per Zentralblatt/ZMATH.

2007 Member of the committee for the Ph.D. grants competitions, Pavia.

Since 2004 Member of the committee for the employment of researchers within the CNR.

Main reviewer activity

2017 Chiar of the evaluation panel for the INRIA Theme : Numerical Schemes and Simulation

2013 Reviewer of the INRIA Theme: Computational Models and Simulation, 13 research teams.

Since 2011 Reviewer for the European Research Council (ERC).

Since 2008 Reviewer for the Austrian Science Fund.

Since 2008 Reviewer for the Suisse National Science Foundation (SNSF).

Since 2007 Reviewer for the FONDECYT (Chilean Research Fund Council).

Organization of invited sessions, workshops and conferences

2019 Co-organizer of the Oberwolfach worshop 1929b: Mathematical Foundations of Isogeometric Analysis. Co-organizers: C. Manni, A. Kunoth, T. J.R. Hughes

2018 Co-organizer of the Oberwoldach workshop 1843: Computational Engineering. Co-organizers: O. Allix, C. Carstensen, J. Schroeder

2018 ESI Thematic programme on Numerical analysis of complex PDE models in the sciences, Vienna, June 11-August 17, 2018. Co-organizers: I. Perugia, M. Melenk, Ch. Schwab, T. Hou

2017 **Co-chair of the *V International Conference on Isogeometric Analysis, IGA 2017***, Pavia, September 11-13, 2017. Co-chairs: A. Reali, G. Sangalli, F. Auricchio.

2017 Workshop *Foundations of Numerical PDEs*, within FoCM Conference, Barcelona, July. Co-organizers: R. Nochetto and E. Suli.

2014 Workshop *Multiresolution and adaptivity in numerical PDEs*, within FoCM Conference, Montevideo, December. Co-organizers: A. Kunoth and P. Morin.

2014 Invited session on *isogeometric methods* at Curves and Surfaces, Paris, June.

2012 CIME Summer School: *Isogeometric Analysis: a new paradigm in the numerical approximation of PDEs*, Cetraro (CS), Italy. Co-organizer: G. Sangalli.

2011 Workshop *Multiresolution and adaptivity in numerical PDEs*, within FoCM Conference, Budapest, Hungary. Co-organizer: A. Kunoth.

2010 Workshop *Non-Standard Numerical Methods for PDEs*, Pavia, Italy. Co-organizers: D. Boffi, C. Lovadina, I. Perugia, G. Sangalli.

2010 INDAM "Trimestre Intensivo": *Innovative Numerical Methods for PDE's*. Co-organizers: D. Boffi, I. Perugia, G. Sangalli.

2006-2008 Organizer of the Applied Mathematics Seminars, IMATI-CNR, Pavia, Italy.

2005 Member of the Organizing Committee for the Third Finite Element Fair, Pavia, Italy.

2001 Member of the Organizing Committee for the ENUMATH Conference, Ischia, Italy.

2001-2014 I have organized several minisymposia or invited sessions at international conferences.

Research Funding

2016-2020 **ERC Advanced Research Grant**, awarded by the European Research Council for the project: CHANGE: *New CHallenges for (adaptive) PDE solvers: the interplay of ANalysis and GEometry* .

2015-2019 **EU H2020-FoF-08-2015**, project n. 680448, CAxMAN: *Computer Aided Technologies for Additive Manufacturing*. Role: Unit coordinator (Pavia). Coordinator: SINTEF, Norway.

2015-2017 Research contract with **Michelin, Centre de Technologies de Ladoux**, France. Title: *Isogeometric methods*. Role: Principal Investigator.

2013-2017 Research contract with **TOTAL Scientific division** & **Hutchinson SA Direction R & D Centre de Recherche**, France. Title: *An innovative solver for large deformation problems*. Role: Principal Investigator (with G. Sangalli). Partners: G. Elber Technion (Haifa) and F.X. Roux LJLL (Paris)

2013-2016 Research contract with **Michelin, Centre de Technologies de Ladoux**, France. Title: *Isogeometric methods for contact mechanics*. Role: Principal Investigator.

2012-2013 Research contract with **TOTAL Scientific division**, France. Title: *Isogeometric methods for large deformations*. Role: Principal Investigator (with G. Sangalli).

2011-2012 Research contract with **Hutchinson SA Direction R & D Centre de Recherche**, France. Title: *Isogeometric methods for large deformations*. Role: Principal Investigator (with G. Sangalli and A. Reali).

2011-2014 **FoF ICT-2011.7.4 Digital factories.** Project *Towards Enhanced Integration of Design and Production in the Factory of the Future through Isogeometric Technologies*. 2011-2015. Role: participant. Coordinator: SINTEF, Norway.

2010-2014 FIRB - Futuro in Ricerca. Project *Isogeometric Discretizations in Continuum Mechanics* 2010-2014. Role: Participant. PI: Giancarlo Sangalli.

2009-2014 **ERC Starting Independent Grant 2008-2013**, GeoPDEs n. 205004. *Innovative compatible discretization techniques for Partial Differential Equations*. Principal Investigator.

2006-2008 Progetto PRIN, n. 2006013187 *Metodi numerici avanzati per il calcolo scientifico* , 2006-2008. Role: partecipant. Coordinator: Prof. Franco Brezzi.

2002-2006 EC-IHP Network *Breaking Complexity*. Non Linear Approximation and Adaptivity: Breaking Complexity in the Numerical Modelling and Data Representation. EU's Sixth Framework Programme, 2002-2006. Role: partecipant. Coordinator: CNR-Pavia.

2000-2003 Italian project FIRB, *Metodi avanzati di previsione e di ottimizzazione della distrubuzione di campo elettromagnetico per sistemi di telefonia mobile cellulare GSM e UMTS in ambiente urbano.* Role: partecipant. Coordinator: Università degli Studi di Genova.

Publications

Journal papers

[1] P. Antolin, A. Buffa, M. Fabre *A priori error for unilateral contact problems with Lagrange multipliers and isogeometric analysis* IMA J. Numer. Anal., (2018) https://doi.org/10.1093/imanum/dry041

[2] A. Buffa, E. Garau *A Posteriori Error Estimators for Hierarchical B-Spline Discretizations*, Math. Models Methods Appl. Sci. 28 (2018), no. 8, 1453âĂŞ1480.

[3] A. Buffa, C. Giannelli *Adaptive isogeometric methods with hierarchical splines: optimality and convergence rates*. Math. Models Methods Appl. Sci. 27 (2017), no. 14, 2781–2802.

[4] A. Buffa, E. Garau *Refinable spaces and local approximation estimates for hierarchical splines*, IMA J. Numer. Anal. 37 (2017), no. 3, 1125–1149.

[5] P. Antolin , A. Bressan , A. Buffa, G. Sangalli *An isogeometric method for linear nearly-incompressible elasticity with local stress projection,* Comput. Methods Appl. Mech. Engrg. 316 (2017), 694–719.

[6] A. Buffa, C. Giannelli, P. Morgenstern, D. Peterseim *Complexity of hierarchical refinement for a class of admissible mesh configurations,* Comput. Aided Geom. Design 47 (2016), 83–92.

[7] A. Buffa, C. Giannelli *Adaptive isogeometric methods with hierarchical splines: error estimator and convergence,* Math. Models Methods Appl. Sci. 26 (2016), no. 1, 1–25.

[8] A. Bressan, A. Buffa, G. Sangalli *Characterization of analysis-suitable T-splines,* Comput. Aided Geom. Design 39 (2015), 17–49.

[9] P. Antolin, A, Buffa, F. Calabrò, M. Martinelli, G. Sangalli *Efficient matrix computation for tensor-product isogeometric analysis: the use of sum factorization,* Comput. Methods Appl. Mech. Engrg. 285 (2015), 817–828.

[10] A. Buffa, R. Vazquez, G. Sangalli, L. Beirão da Veiga *Approximation Estimates for Isogeometric Spaces in Multipatch Geometries,* Numer. Methods Partial Diff. Eq. 31 - 2 (2015), 422–438

[11] E. Brivadis, A. Buffa, A., B. Wohlmuth and L. Wunderlich *Isogeometric mortar methods,* Comput. Methods Appl. Mech. Engrg., 284 (2015), 292–319.

[12] F. Bonizzoni, A. Buffa and F. Nobile *Moment equations for the mixed formulation of the Hodge Laplacian with stochastic loading term*, IMA J. Numer. Anal. 34 (2014), no. 4, 1328–1360.

[13] R. Vázquez, A. Buffa, and L. Di Rienzo *Isogeometric FEM implementation of high order surface impedance boundary conditions,* IEEE Trans. Magn., 50-6 (2014).

[14] R.. Vázquez, A. Buffa, L. Di Rienzo and D. Li *Isogeometric Finite Elements With Surface Impedance Boundary Conditions*, IEEE Trans. Magn., 50 -2, (2014) 429–432.

[15] L. Beirão da Veiga, A. Buffa, G. Sangalli, R. Vázquez *Mathematical analysis of variational isogeometric methods,* Acta Numer. 23 (2014), 157–287.

[16] F. Brezzi, A. Buffa, G. Manzini *Mimetic scalar products of discrete differential forms,* J. Comput. Phys. 257 (2014), 1228–1259.

[17] A. Buffa, G. Sangalli, R. Vázquez *Isogeometric methods for computational electromagnetics: B-spline and T-spline discretizations,* J. Comput. Phys. 257 (2014), 1291–1320.

[18] A. Buffa, H. Harbrecht, A. Kunoth, G. Sangalli, *BPX-preconditioning for isogeometric analysis,* Comput. Methods Appl. Mech. Engrg. 265 (2013), 63–70.

[19] D. Boffi, A. Buffa, and L. Gastaldi. *Convergence analysis for hyperbolic evolution problems in mixed form* , Numerical Linear Algebra with Applications, n. 20(4) (2013), pp 541–556.

[20] L. Beirão da Veiga, A. Buffa, and G. Sangalli, R. Vàzquez. *Analysis-suitable T-splines of arbitrary degree: Definition, linear independence and approximation properties* , Math. Models Methods Appl. Sci. n.2, (2013) pp. 1–25.

[21] P. Bagnerini, A. Buffa, E. Vacca, *Mesh generation and numerical analysis of a Galerkin method for highly conductive prefractal layers* , Appl. Numer. Mathem. 65, (2013) pp. 63-78.

[22] L. Beirão da Veiga, A. Buffa, D. Cho, and G. Sangalli. *Analysis-Suitable T-splines are Dual-Compatible*, Comput. Methods Appl. Mech. Engrg, 249/252 (2012), 42–51.

[23] A. Buffa, Y. Maday, A.T. Patera, C. Prud'homme, G. Turinici , *A priori convergence of the greedy algorithm for the parametrized Reduced Basis methods*, ESAIM Math. Model. Numer. Anal. 46 (2012), no. 3, 595–603.

[24] R. Vazquez, A. Buffa, and L. Di Rienzo, *NURBS-based BEM implementation of high order surface impedance boundary conditions*, IEEE Transactions on Magnetics, vol. 48, No. 12 (2012) pp. 4757-4766.

[25] A. Buffa, D. Cho, M. Kumar, *Characterization of T-splines with reduced continuity order on T-meshes*, Comput. Methods Appl. Mech. Engrg., 201–204, 1 (2012), pp. 112-126.

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