CURRICULUM VITAE

Date: 28/01/2022
Abramo Agosti
email: abramo.agosti@unipv.it
ORCID ID: 0000-0001-5706-3772

Current Position

– Since March 2021:
Assistant professor, Universitá degli studi di Pavia.
Department of Mathematics

Previous Positions

– February 2020 - January 2021:
Scientific Collaborator, IRCCS Mondino Foundation.
Advanced Imaging and Radiomics center, Neuroradiology department
Subject: Development of Deep Learning alghorithms and computational models for the processing of Neuro Images and for Personalized Medicine.

– April 2018 - January 2020:
Scientific Collaborator, MOX Laboratory, Department of Mathematics, Politecnico di Milano.
Funded by AIRC grant MFAG 17412.
Supervisor: Prof. P. Ciarletta. *Subject*: Mathematical Analysis and Numerical implementation of optimization algorithms for personalized oncology.

– April 2016 - March 2018:
Post Doctoral Researcher, MOX Laboratory, Department of Mathematics, Politecnico di Milano.
Funded by AIRC grant MFAG 17412.
Supervisor: Prof. P. Ciarletta. *Subject*: Mathematical modeling of cancer development.

– April 2014 - March 2016:
Post Doctoral Researcher, Department of Mathematics, Politecnico di Milano.
Funded by FARB grant.
Supervisor: Prof. M. Grasselli. *Subject*: Mathematical Analysis and Numerics of Diffuse Interface models.

– April 2013 - March 2014:
Post Doctoral Researcher, MOX Laboratory, Department of Mathematics, Politecnico di Milano.
Funded by ENI.
Supervisor: Prof. L. Formaggia. *Subject*: Mathematical Analysis and Numerical implementation of reactive flows in porous media.

– May 2012 - March 2013:
Research Fellow, Department of Mathematics and Physics, Universitá Cattolica del Sacro Cuore di Brescia.
Supervisor: Prof. F. Borgonovi. *Subject*: Mathematical modeling of Turbulence for particles remixing in urban areas.

Research fields

Analysis of PDE's; Numerical Analysis; Mathematical Physics; Optimization problems for Personalized Medicine; Deep Learning and Artificial Intelligence.

Techincal skills

Knowledge of the programming languages C, C++, Python, Matlab; knowledge of the Finite Element libraries FreeFem++, Fenics, LifeV; knowledge of the Tensorflow platform for Deep Learning; knowledge of the softwares itk, vtk, VMTK, FSL, FreeSurfer for geometric analysis and image processing.

Education

– Phd in Physics, Astrophysics and Applied Physics. Universitá degli studi di Milano. February 2013, Ciclo XXIV.
Thesis: Models of turbulence. Applications to particulate mixing induced by traffic flow in urban areas.
Advisor: Prof. F. Borgonovi.

– Master degree in Physics, 110/110 Summa cum laude. Universitá Cattolica del Sacro Cuore di Brescia. July 2007.
Thesis: Tachion condensation in cubic String Field Theory.
Advisor: Prof. G. Nardelli.

– Bachelor's degree in Physics, 110/110 Summa cum laude. Universitá Cattolica del Sacro Cuore di Brescia. December 2004.

Awards

– 2007: XLVIII Agostino Gemelli Prize as best graduate at Faculty of Scienze Matematiche, Fisiche e Naturali.

Funded Projects

– 2018: Progetto Giovani GNFM Indam.
Role: participant.
Subject: Mathematical model for the GlioBlastoma growth.
Funding: 4000 euro.

Invited talks to international conferences

C1 SIMAI-UMI-PTM joint meeting. Mathematical Modelling for Complex Systems: Seeking New Frontiers. Wroclaw, Poland, 17-20 September, 2018.
Organizers: Unione Matematica Italiana, Societá Italiana di Matematica Applicata e Industriale, Polish Mathematical Society.

C2 SMACS2018. Special materials and complex systems. Gargnano, Italy, 18-22 June, 2018.
Organizers: E. Bonetti, C. Cavaterra (University of Milan), E. Rocca (University of Pavia), R. Rossi (University of Brescia).

C3 Numerical Methods for PDES. ME2 conference: Advanced numerical methods: recent developments, analysis and applications. Institut Henri Poincar, Paris, Fr., 3-7 October 2016.
Organizers: D. Di Pietro (University of Montpellier), A. Ern (Ecole Polytechique of Paris), L. Formaggia (Politecnico di Milano).

C4 The XIII biannual congeress of SIMAI. MS.60 - Small-scale Solid and Fluid Mechanics in Biology, Part I. Milano, Italy, 13-16 September 2016.
Organizers: D. Ambrosi, P. Zunino (Politecnico di Milano).

C5 ACOMEN. 6th International Conference on Advanced Computational Methods in Engineering. Ghent, Belgium, 23-28 June 2014.
Organizers: M. Slodicka (University of Ghent).

Other invited talks to international workshops and seminars

T1 Radiomics Toolbox. Workflow and quality management. Neural networks for automatic segmentation. Pavia, Italy, 8-9-10 September 2021.
Organizers: A. Pichiecchio, L. Preda and A. Filippi (University of Pavia).

T2 Workshop PHASE2019. Recent advances in Phase-Field modeling: from Engineering to Biology. Pavia, Italy, 8-10 May 2019.
Organizers: E. Rocca and A. Reali (University of Pavia).

T3 Oberwolfach Workshop. Surface, Bulk, and Geometric Partial Differential Equations: Interfacial, stochastic, non-local and discrete structures. Oberwolfach, Germany, 20-26 January 2019.
Organizers: C.M. Elliott (University of Warwick), H. Garcke (University of Regensburg), R. Kornhuber (University of Berlin).

T4 Seminario di Matematica Applicata at IMATI-CNR and Dipartimento di Matematica di Pavia, Pavia, Italy, 17 April 2018..
Organizers: E. Rocca (University of Pavia).

T5 Oberwolfach Workshop. The Mathematics of Mechanobiology and Cell Signaling. Oberwolfach, Germany, February 25-March 03, 2018.
Organizers: D. Ambrosi (Politecnico di Milano), C. Liu (University Park), M. Roger (University of Dortmund), A. Stevens (University of Munster).

T6 International Workshop on Modelling of Nonlinear Continua. Castro Urdiales, Cantabria, Spain, 26-30 June 2017.
Organizers: J. Merodio (Universidad Politecnica de Madrid) and R. Ogden (University of Glasgow).

T7 XL Summer School on Mathematical Physics, Ravello, Italy, 14-26 September 2015.
Organizers: T. Ruggeri (University of Bologna) and S. Rionero (University of Napoli).

Invited visiting period abroad

V1 January 27 – February 02, 2019. Laboratoire Jacques-Louis Lions, Université Sorbonne, Paris. Collaboration with Prof. B. Perthame and Prof. L. Almeida.

V2 October 07 – 11, 2018. University of Regensburg. Collaboration with Prof. H. Garcke nd Prof. Michael Hinze.

Pubblications list

- **Articles in peer-reviewed international journals and book chapters**

– **Submitted**

– **Printed**

1 A. Agosti, E. Shaqiri, M. Paoletti, G. Savini, G. Colelli, F. Solazzo, S. I. Muzic, F. Santini, X. Deligianni, M. Monforte, G. Tasca, S. Bastianello, E. Ricci, A. Pichiecchio: "Deep Learning for Automatic Segmentation of thigh and leg muscles". Magn. Reson. Mater. Phy., 2021.
DOI: https://doi.org/10.1007/s10334-021-00967-4

2 F. Lizzi, A. Agosti, F. Brero, R. F. Cabini, M. E. Fantacci, S. Figini, A. Lascialfari, F. Laruina, P. Oliva, S. Piffer, I. Postuma, L. Rinaldi, C. Talamonti, A. Retico: "Quantification of pulmonary involvement in COVID-19 pneumonia by means of a cascade of two U-nets: training and assessment on multiple datasets using different annotation criteria". International Journal of Computer Assisted Radiology and Surgery. 2021

3 J. Falco, A. Agosti, I. G. Vetrano, A. Bizzi, F. Restelli, M. Broggi, M. Schiariti, F. DiMeco, P. Ferroli, P. Ciarletta, F. Acerbi "In Silico Mathematical Modelling for Glioblastoma: a Critical Review and a Patient-Specific Case". Journal of Clinical Medicine, 10(10), 2169, 2021.
DOI: https://doi.org/10.3390/jcm10102169

4 A. Perrillat-Mercerot, A. Miranville, A. Agosti, E. Rocca, P. Ciarletta, R. Guillevin: "Partial differential model of lactate neuro-energetics: analytic results and numerical simulations". Mathematical Medicine and Biology: A Journal of the IMA, dqaa016, 2021.
DOI: https://doi.org/10.1093/imammb/dqaa016

5 F. Acerbi, A. Agosti, J. Falco, S. Marchesi, I. G. Vetrano, F. DiMeco, A. Bizzi, P. Ferroli, G. Scita, P. Ciarletta: "Mechano-Biological Features in a Patient-Specific Computational Model of Glioblastoma". In: Seano G. (eds) Brain Tumors. Neuromethods, vol 158. Springer, New York, NY, 2021.
DOI: https://doi.org/10.1007/978-1-0716-0856-2_12.

6 A. Agosti, P. Ciarletta, H. Garcke, M. Hinze: "Learning patient-specific parameters for a diffuse interface glioblastoma model from neuroimaging data". Math Meth Appl Sci., 135, 2020.
DOI: https://doi.org/10.1002/mma.6588.

7 A. Agosti, S. Marchesi, G. Scita, P. Ciarletta: "Modelling cancer cell budding in-vitro as a self-organised, non-equilibrium growth process". Journal of Theoretical Biology 492, 110203, 2020.
DOI: https://doi.org/10.1016/j.jtbi.2020.110203.

8 A. Agosti: "Discontinuous Galerkin Finite Element discretization of a degenerate Cahn-Hilliard equation with a single-well potential". Calcolo, 56(2), 2019.
DOI: https://doi.org/10.1007/s10092-019-0310-y.

9 D. Riccobelli, A. Agosti, P. Ciarletta: "On the existence of elastic minimizers for initially stressed materials". Philosophical Transactions of the Royal Society A, 377(2144), 2019.
DOI: https://doi.org/10.1098/rsta.2018.0074.

10 A. Agosti, C. Giverso, E. Faggiano, A. Stamm, P. Ciarletta: "A personalized mathematical tool for neuro-oncology: a clinical case study". International Journal of Nonlinear Mechanics, 107, pp. 170–181, 2018.
DOI: https://doi.org/10.1016/j.ijnonlinmec.2018.06.004

11 A. Agosti, D. Ambrosi, S. Turzi: "Strain energy storage and dissipation rate in active cell mechanics". Physical Review E, 97(5), pp. 052410, 2018.
DOI: https://doi.org/10.1103/PhysRevE.97.052410.

12 A. Agosti, C. Cattaneo, C. Giverso, D. Ambrosi, P. Ciarletta: "A computational framework for the personalized clinical treatment of glioblastoma multiforme". ZAMMJournal of Applied Mathematics and Mechanics/Zeitschrift fr Angewandte Mathematik und Mechanik, 98(12), pp. 2307–2327, 2018.
DOI: https://doi.org/10.1002/zamm.201700294.

13 A. Agosti: "Error analysis of a finite element approximation of a degenerate Cahn-Hilliard equation". ESAIM Mathematical Modelling and Numerical Analysis, 52(3), pp. 827–867, 2018.
DOI: https://doi.org/10.1051/m2an/2018018.

14 A. Agosti, A. L. Gower, P. Ciarletta: "The constitutive relations of initially stressed incompressible Mooney-Rivlin materials". Mechanics Research Communications 93, pp. 4–10, 2017.
DOI: https://doi.org/10.1016/j.mechrescom.2017.11.002.

15 A. Agosti, P. F. Antonietti, P. Ciarletta, M. Grasselli, M. Verani:"A Cahn-Hilliard type equation with application to tumor growth dynamics". Mathematical Methods in the Applied Sciences, 40(18), pp. 7598–7626, 2017.
DOI: https://doi.org/10.1002/mma.4548.

16 A. Agosti, B. Giovanardi, L. Formaggia, A. Scotti: "A numerical procedure for geochemical compaction in the presence of discontinuous reactions". Advances in Water Resources, 94, pp. 332–344, 2016.
DOI: https://doi.org/10.1016/j.advwatres.2016.06.001.

17 A. Agosti, L. Formaggia, A. Scotti: "Analysis of a model for precipitation and dissolution coupled with a Darcy flux". Journal of Mathematical Analysis and Applications, 431(2), pp. 752–781, 2015.
DOI: https://doi.org/10.1016/j.jmaa.2015.06.003.

18 A. Agosti: "Models of Turbulence. Applications to Particulate Mixing induced by traffic flow in Urban Areas". Phd Thesis. http://hdl.handle.net/2434/217169.
DOI: http://dx.doi.org/10.13130/agosti-abramo_phd2013-02-13.

- **Articles in international conference proceedings**

P1 A. Agosti: "A diffuse interface model for the patient specific evolution of Glioblastoma Multiforme". Mathematisches Forschungsinstitut Oberwolfach, Report No. 3/2019, Surface, Bulk, and Geometric Partial Differential Equations: Interfacial, stochastic, non-local and discrete structures.
DOI: 10.4171/OWR/2019/3

P2 A. Agosti, L. Formaggia, B. Giovanardi, A. Scotti. "Numerical simulation of geochemical compaction with discontinuous reactions". Coupled Problems 2015 - Proceedings of the 6th International Conference on Coupled Problems in Science and Engineering, pp. 300–311, 2015.

P3 M. Chiesa, A. Agosti, R. Zambianchi, A. Ballarin-Denti: "PM10 resuspension contribution due to traffic in Brescia (Northern Italy)". Conference Paper - European Aerosol Conference, 2015. Milano.

Software production

S1 A. Agosti: "Dnn muscle segmentation: Release 1.0.1 (version v1.0.1)". Zenodo (2021).
DOI: http://doi.org/10.5281/zenodo.4479168

S2 F. Santini, J. Wasserthal, A. Agosti: "DAFNE. Deep Anatomic Federated NEtwork".2021.
https://www.dafne.network/

Teaching activities

I served as a teaching professor for the following course at Universitá degli studi di Pavia:

- 2020–2021: Analisi 2, Civil–Environmental Engineering and Construction–Architecture Engineering (60 hours per year).

I served as a teaching assistant for the following courses at Politecnico di Milano:

- 2014–2019: Meccanica dei Continui II, Mathematical Engineering, held by prof. M. Vianello and D. Ambrosi (20 hours per year).
- 2015–2019: Biomathematical Modeling, Mathematical Engineering, held by prof. A. Marzocchi and D. Ambrosi (30 hours per year).
- 2016–2019: Geometria Differenziale, Mathematical Engineering, held by prof. E. Schlesinger (20 hours per year).
- 2018–2019: Meccanica Razionale, Material Engineering, held by prof. P. Ciarletta (20 hours per year).

Supervision activities

I served as a co-supervisor for the Master Theses of four students of Politecnico di Milano (in the academic years 2014-2015, 2016-2017, 2018-2019), of a student of University Milano Bicocca (in the academic year 2017-2018) and of a student of Politecnico di Torino (in the academic year 2018-2019).

Service activities

I served as a reviewer for the following international journals:

- Mathematical Methods in the Applied Sciences
- Computers and Mathematics with Applications.
- International Journal of Non Linear Mechanics.
- Journal of Theoretical Biology.
- ESAIM: Mathematical Modelling and Numerical Analysis .
- Nonlinear Analysis.

– Mathematical Reviews/MathSciNet

Autorizzo il trattamento dei dati personali contenuti nel mio curriculum vitae in base allart. 13 del D. Lgs. 196/2003 e allart. 13 GDPR 679/16.