Alessio Quaglino

Postdoctoral Researcher

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Personal

Birth	April 25th, 1983, Cantú (Italy)
Citizenship	Italian

Interests

I create innovative methods for the discretization, optimization, and uncertainty quantification of complex (bio)mechanical systems.

Positions

2015–present	**Postdoctoral Researcher**, *Universitá della Svizzera Italiana*, Lugano, CH.
2012–2015	**Vehicle Dynamics Engineer**, *McLaren Racing Ltd*, Woking, UK.
2007–2007	**Physics Programmer**, *Craft Animations AB*, Gothenburg, Sweden.

Education

2012	**PhD in Applied Mathematics**, *Georg-August University*, Goettingen, Germany.
2008	**MSc in Engineering Mathematics**, *Politecnico di Milano*, Milan, Italy.
2007	**MSc in Engineering Physics**, *Royal Institute of Technology*, Stockholm, Sweden.
2005	**BSc in Engineering Mathematics**, *Politecnico di Milano*, Milan, Italy.

Awards and grants

2016	*Multilevel Methods and Uncertainty Quantification in Cardiac Electrophysiology* SNF project grant as Scientific Collaborator
	Swiss Graduate Program DADSi Data Analytics and Data-driven Simulations Participation in proposal writing
2005	*Top Industrial Managers for Europe (T.I.M.E.)* EU scholarship for student mobility aimed at a double master in engineering

Research projects

2017–present	*FASTER - Forecasting and Assessing Seismicity and Thermal Evolution in geothermal Reservoirs* - Platform for Advanced Scientific Computing (PASC) PI: Thomas Driesner (ETH Zurich). Co-PIs: Stefan Wiemer (ETH Zurich), Rolf Krause (USI Lugano), Domenico Giardini (ETH Zurich)
2017–present	*HPC-PREDICT - High-Performance Computing for the Prognosis of Adverse Aortic Events* - Platform for Advanced Scientific Computing (PASC) PI: Dominik Obrist (Uni Bern). Co-PIs: Sebastian Kozerke, Ender Konukoglu (ETH Zurich), Thierry Carrel, Hendrik von Tengg-Kobligk (Uni Bern), Rolf Krause (USI Lugano)
2106–present	*HEARTFUSION: Imaging-driven Patient-specific Cardiac Simulation* - SNF PI: Rolf Krause (USI Lugano). Co-PI: Zheng Guoyan (Uni Bern)

2106–present	*Multilevel Methods and Uncertainty Quantification in Cardiac Electrophysiology* - SNF
	PI: Helmut Harbrecht (Uni Basel). Co-PI: Rolf Krause (USI Lugano)
2015–present	*Center for Computational Medicine in Cardiology*
	PIs: Rolf Krause (USI Lugano) and Angelo Auricchio (Cardiocentro Ticino)

Administrative responsabilities

2017–present	*Graduate program in Data Analyics and Data-driven Simulations (DADSi)*
	Committee: Rolf Krause, Antonietta Mira (USI)
2016–present	*Graduate program in Foundations in Mathematics and Informatics for Computer Simulations in Science and Engineering (FoMICS)*
	Committee: Rolf Krause, Olaf Schenk (USI)

Supervised students

2017-present	Seif Ben Bader, PhD candidate within the project *Multilevel Methods and Uncertainty Quantification in Cardiac Electrophysiology*
	Toby Simpson, PhD candidate within the project *HEARTFUSION - Imaging-driven Patient-specific Cardiac Simulation*

Industrial experience

2016–present	*Algo4U Sagl - Co-founder*
	Development of customized algorithmic and software solutions for Life Sciences, MedTech, Engineering, Simulation, Optimization, and Data Analytics.
2015–2016	*PUPAx - Phase Unwrapping Parallel Accelerator*
	PIs: Rolf Krause (USI Lugano) and Paolo Pasquali (Sarmap SA)
2012–2015	*Vertical dynamics and suspensions* at McLaren Racing (Woking,UK)
	Optimization of Formula 1 suspensions design via Simulink modeling and sensitivity analysis. Ensuring state-of-the-art simulation correlation with telemetry data, using rig tests and trackside analysis.

Organization of scientific events

2017	FoMICS school in *Fluid-structure interaction* - Main organizer
	CSCS-DADSi school in *Accelerating Data Science with HPC* - Co-organizer
	FoMICS prize for PhD students at PASC17 - Co-organizer and panel member
	6th Workshop on *Parallel-in-Time methods* - Co-organizer
2016	FoMICS school in *Uncertainty quantification* - Main organizer

Teaching

2017	Bachelor course in *Optimization* - Substitute lecturer (4 hours)
2017	Bachelor course in *Optimization* - Substitute lecturer (16 hours)
2009	Master course in *Partial Differential Equations* - Teaching assistant

Publications

In review	A.Q., S. Pezzuto, and R .Krause, *Uncertainty quantification in cardiac electrophysiology: fast patient-specific methods for clinical practitioners*.
	A.Q. and R. Krause, *kFEM: adaptive meshfree finite element methods using local kernels on arbitrary subdomains*.

2017	A.Q., M. Favino, and R. Krause, *Quasi-quadratic elements for nonlinear incompressible elasticity*, Computational Mechanics.
2016	A.Q. and R. Krause, *Towards a multigrid method for the minimum-cost flow problem*, Technical Report (available on arXiv).
	A.Q., *A framework for creating low-order shell elements free of membrane locking*, Int J Numer Meth Eng, Vol. 108, issue 1, pp. 55–75.
2012–2015	More than 20 technical reports authored at McLaren Racing Ltd on the modeling and analysis of F1 suspension dynamics (covered by NDA).
2012	A.Q, *Membrane locking in discrete shell theories*, PhD Thesis, Advisors: Prof. M. Wardetzky and Prof. G. Lube.
2008	A.Q., *Simulation of collision deformations*, MSc Thesis, Advisors: Prof. J. Hoffman and Prof. F. Nobile.
2005	A.Q., *An inverse technique for sedimentary basins*, BSc Thesis, Advisor: Prof. F. Saleri.

Conference contributions

2017	*Uncertainty Quantification in Cardiac Electrophysiology*, poster SPEEDUP 2017, Bern - Best poster award QUIET 2017, Trieste
	Quasi-quadratic elements for nonlinear incompressible elasticity, talk Swiss Numerical Analysis Day 2017, Basel
2016	*PUPAx - Phase Unwrapping Parallel Accelerator*, talk Space Technologies Studies 2016, Lausanne
2010	*Towards a Nonlinear Shearable Shell*, talk Workshop for non-standard numerical methods for PDEs, Pavia
	Discrete Cosserat Shells, poster Symposium on Geometry Processing

Software contributions

2016–present	*SLOTH* at ICS (USI Lugano) Development of a Python library for uncertainty quantification and data assimilation, aimed at high-performance multilevel and multifidelity Monte Carlo and particle filters methods.
2015–2016	*SARScape* at Sarmap SA (Switzerland) Funded by the Swiss Space Office, we developed an interior-point algorithm to solve the minimum-cost flow problem on GPUs.
2012–2105	*MIDAS* at McLaren Ltd. (England) Development of MATLAB and SIMULINK tools for the simulation suspension dynamics and the analysis of car telemetry.
2008–2012	*Meshopt*, with Prof. Eitan Grinspun (Columbia University) Meshopt is a C++ library for cloth simulation based on Finite Differences. We extended it to nonlinearly-constrained FE for shells and r-adaptivity.
2006–2007	*Maya and 3DS plug-ins* at Craft Animations AB (Gothenburg, Sweden) Craft Animations produces physics-based tools for 3D animators. I coupled a C++ physics middleware (Bullet) with a FE library (FEniCS). Implemented a collision detection algorithm and developed a viscoplastic model. Worked at efficient intergration of stiff ODEs.