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Full List of Publications (June 20, 2022)

Preprints/In review

- F. Galarce, K. Tabelow, J. Polzehl, C. Panagiotis Papanikas, V. Vavourakis, L. Lilaj, I. Sack, A. Caiazzo, *Displacement and pressure reconstruction from magnetic resonance elastography images: Application to an in silico brain model* (submitted to SIAM IS, 2022), WIAS Preprint 2933

- O. Partl, U. WIlbrandt, J. Mura, A. Caiazzo Reconstruction of flow domain boundaries from velocity data via multi-step optimization of distributed resistance (submitted to Comp. Math. w. Appl., 2022).

Refereed Journal Publications

36. L. Heltai, A. Caiazzo, L.O. Müller. *Multiscale Coupling of One-dimensional Vascular Models and Elastic Tissues*, Ann. Biomed. Engnr. **49**, 3243–3254 (2021)

35. L. Lilaj, H. Herthum,T. Meyer, M. Shahryari, G. Bertalan, A. Caiazzo,J. Braun,T. Fischer,S. Hirsch,I. Sack, *Inversion-recovery MR elastography of the human brain for improved stiffness quantification near fluid–solid boundaries*, **86**(5), 2552–2661 (2021)

34. L. Blank, E. Meneses. U. Wilbrandt, A. Caiazzo. *Modeling, Simulation, and Optimization of Geothermal Energy Production from Hot Sedimentary Aquifers*, Computational Geosciences **25**, 67–104, 2021

33. A. Caiazzo, R. Maier, D. Peterseim. *Reconstruction of quasi-local numerical effective models from low-resolution measurements*, J. Scientific Computing **85**(10), 2020 (available online)

32. L. Blank, E. Meneses. U. Wilbrandt, A. Caiazzo. *Modeling, Simulation, and Optimization of Geothermal Energy Production from Hot Sedimentary Aquifers*, Computational Geosciences 2020 (available online)

31. C. McNamara, A. Caiazzo, I. Ramis-Conde, M. Chaplain. *Computational modelling and simulation of cancer growth and migration within a 3D heterogeneous tissue: The effects of fibre and vascular structure* J. Comp. Science, **40**, 101067 (2020)

30. L. Heltai, A. Caiazzo. *Multiscale modeling of vascularized tissues via non-matching immersed methods* Int. J. Num. Methods Biomed. Engnr., **35**(12), e3264 (2019)

29. L. Blank, A. Caiazzo, F. Chouly, A. Lozinksi, J. Mura. *Analysis of a stabilized penalty-free Nitsche method for the Brinkman, Stokes, and Darcy problems.* M2AN **52**(6)

2149–2185 (2019)

28. L.O. Müller, A. Caiazzo, P.J. Blanco. *Reduced-order unscented Kalman filter in the frequency domain: Application to computational hemodynamics.* IEEE Trans. Biomed. Engnr. **66**(5), 1269–1276 (2019)

27. C. Bertoglio, A. Caiazzo, Y. Bazilevs, M. Braack, M. Emaily-Moghadam, V. Gravemeier, A.L. Marsden, O. Pironneau, I.E. Vignon-Clementel, W.A. Wall, *Benchmark problems for numerical treatment of backflow at open boundaries*, International Journal for Numerical Methods in Biomedical Engineering **34**(2) (2018)

26. U. Wilbrandt, C. Bartsch, N. Ahmed, N. Alia, F. Anker, L. Blank, A. Caiazzo, S. Ganesa, S. Giere, G. Matthies, R. Meesala, A. Shamim, J. Venkatesan, V. John *ParMooN – a modernized program package based on mapped finite elements*, Computers and Mathematics with Applications **7**(1), pp. 74–88 (2017)

25. A. Caiazzo, F. Caforio, G. Montecinos, L. O. Muller, P. J. Blanco, E. F. Toro. *Assessment of reduced-order unscented Kalman filter for parameter identification in one-dimensional blood flow models using experimental data.* International Journal for Numerical Methods in Biomedical Engineering **33**(8), pp. e2843 (2017)

24. C. Bertoglio, A. Caiazzo. *A Stokes-residual backflow stabilization method applied to physiological flows.* Journal of Computational Physics **313**, pp. 260–278 (2016)

23. A. Caiazzo, R. Guibert, I.E. Vignon-Clementel. *A reduced-order modeling for efficient design study of artificial valve in enlarged ventricular outflow tracts.* Computer Methods in Biomechanics and Biomedical Engineering **19** (12), pp. 1314–1318 (2016)

22. A. Caiazzo, R. Guibert, Y. Boudjelmine, I.E. Vignon-Clementel. *CFD for the design of a stented valve reducer in enlarged ventricular outflow tracts.* Cardiovascular Engineering and Technology, **6**(4), pp. 485–500 (2015)

21. A. Caiazzo, I. Ramis-Conde. *Multiscale modeling of palisade formation in glioblastoma multiforme.* Journal of Theoretical Biology **383**, pp. 145–56 (2015)

20. A. Caiazzo, G. Montecinos, L.O. Müller, E.M. Haacke, E.F. Toro. *Computational Hemodynamics in Stenotic Internal Jugular Veins.* Journal of Mathematical Biology **70**(4), pp. 745–772 (2015)

19. A. Caiazzo, V. John, U. Wilbrandt. *On iterative subdomain methods for the Stokes-Darcy problem.* Computational Geosciences **18**(5), pp. 711–728 (2014)

18. A. Caiazzo, J. Mura. *Multiscale modeling of weakly compressible elastic materials in harmonic regime and application to microscale structure estimation.* SIAM Multiscale Modeling and Simulation **12**(2) pp. 514–637 (2014)

17. C. Bertoglio, A. Caiazzo. *A tangential regularization method for backflow stabilization with application to blood flow simulations.* Journal of Computational Physics **261**, pp. 162–171 (2014)

16. A. Caiazzo, T. Iliescu, V. John, S. Schyschlowa. *A numerical investigation of velocity-*

pressure reduced order models for incompressible flows Journal of Computational Physics **259**, pp. 598–616 (2014)

15. R. Guibert, K. McLeod, A. Caiazzo, T. Mansi, M.A. Fernández, X. Pennec M. Sermesant, I.E. Vignon-Clementel, Y. Boudjemline, J.-F. Gerbeau. *Group-wise Construction of Reduced Models for Understanding and Characterisation of Pulmonary Blood Flows from Medical Images.* Medical Image Analysis **8**(1), pp. 63–82 (2014)

14. C. Bertoglio, A. Caiazzo, M.A. Fernández. *Fractional-Step Schemes for the Coupling of Distributed and Lumped Models in Hemodynamics.* SIAM J. Scientific Computing **35**(3), pp. B551–B575 (2013).

13. M. Natale, A. Caiazzo, E. Ficarra, E.M. Bucci. *A novel Gaussian fitting approach for 2D-Gel Electrophoresis spot detection.* Genomics, Proteomics & Bioinformathics **10**(6), pp. 336–344 (2012)

12. M. Augustin, A. Caiazzo, A. Fiebach, J. Führmann, V. John, A. Linke, R. Umla. *An assessment of discretizations for convection-dominated convection-diffusion equations.* Computer Methods in Applied Mechanics and Engineering **200** pp. 3395–3409 (2011)

11. A. Caiazzo, M.A. Fernández, V. Martin. *Analysis of a stabilized finite element method for fluid flows through a porous interface* (short communication). Applied Mathematics Letters **24**, pp. 2124-2127 (2011)

10. A. Caiazzo and D. Evans, J.-L. Falcone, J. Hegewald, E. Lorenz, B. Stahl, D. Wang, J. Bernsdorf, B. Chopard, J. Gunn, R. Hose, M. Krafczyk, P. Lawford, R. Smallwood, D. Walker, A.G. Hoekstra. *A Complex Automata approach for In-stent Restenosis: two-dimensional multiscale modeling and simulations.* Journal of Computational Science **2**(1), pp. 9–17 (2011)

9. A. Caiazzo, M.A. Fernández, J.-F. Gerbeau, V. Martin. *Projection schemes for fluid flows through a porous interface, SIAM Journal of Scientific Computing **33**, pp. 541–564 (2011)*

8. A. Caiazzo, M. Junk, M. Rheinländer. *Comparison of analysis techniques for the lattice Boltzmann method.* Computers and Mathematics with Applications **58**(5), pp. 883–897 (2009)

7. A. Caiazzo, S. Maddu. *Lattice Boltzmann boundary conditions via singular forces: irregular expansion analysis and numerical investigations.* Computers and Mathematics with Applications **58**(5), pp. 930–939 (2009)

6. A. Caiazzo, J.L. Falcone, B. Chopard, A.G. Hoekstra. *Asymptotic Analysis of Complex Automata models for Reaction-Diffusion systems.* Applied Numerical Mathematics **59**, pp. 2023–2034 (2009)

5. E. Lorenz, A.G. Hoekstra, A. Caiazzo. *Lees-Edwards boundary conditions for lattice Boltzmann suspension simulations.* Physical Review E **79**(3), 036706 (2009)

4. E. Lorenz, A. Caiazzo, A.G. Hoekstra. *Corrected momentum exchange method for LB*

simulations of suspension flow. Physical Review E **79**(3), 036705 (2009)

3. A. Caiazzo. *Analysis of lattice Boltzmann node initialization in moving boundary problems.* Progress in Computational Fluid Dynamics **8**(1–4), pp. 3–10 (2008)

2. A. Caiazzo, M. Junk. *Boundary forces in lattice Boltzmann: Analysis of Momentum Exchange Algorithm.* Computers and Mathematics with Applications **55**(7), pp. 1415–1423 (2008)

1. A. Caiazzo. *Analysis of lattice Boltzmann initialization routines.* Journal of Statistical Physics **121**(1–2), pp. 37–48 (2005)

Conference Proceedings (peer-reviewed)

- A. Caiazzo, J. Mura, *A two-scale homogenization approach for the estimation of porosity in elastic media*, Trends in Differential Equations and Applications (Proceedings of XXIV CEDYA / XIV CMA), SEMA SIMAI Springer Series **8**, pp. 89–105, Springer International Publishing 2016.

- K. McLeod, A. Caiazzo, M.A. Fernández, T. Mansi, I.E. Vignon-Clementel, M. Sermesant, X. Pennec, Y. Boudjemline, J.F. Gerbeau *Atlas-Based Reduced Models of Blood Flows for Fast Patient-Specific Simulations.* Proceedings of MICCAI 2010, Lecture Notes in Computer Science 6364, pp. 95–104, Springer-Verlag, Berlin Heidelberg 2010.

- A.Caiazzo, D. Evans, et al. *Towards a Complex Automata Multiscale Model of In-Stent Restenosis.* Proceedings of ICCS, Lecture Notes in Computer Science 5544, pp. 705-714, part I, Springer-Verlag, Berlin Heidelberg 2009.

- A. Caiazzo, J.L. Falcone, B. Chopard, A.G. Hoekstra. *Error Investigations in Complex Automata models for Reaction-Diffusion systems.* Proceedings of Complex Automata for Research and Industry (ACRI). H. Umeo et al. (Eds): ACRI 2008, Lecture Notes in Computer Science 5191, pp. 260-267, Springer-Verlag, Berlin Heidelberg 2008.

- B. Chopard, J.L. Falcone, R. Razakanirina, A.G. Hoekstra, A. Caiazzo. *On the collision-propagation and gather-update formulations of a Cellular Automata rule.* Proceedings of Complex Automata for Research and Industry (ACRI). H.Umeo et al. (Eds): ACRI 2008, Lecture Notes in Computer Science 5191, pp.144-251, 2008, Springer-Verlag, Berlin Heidelberg 2008

- A.G. Hoekstra, J.L. Falcone, A. Caiazzo, B. Chopard. *Multi-scale Modeling with Cellular Automata: The Complex Automata Approach.* Proceedings of Complex Automata for Research and Industry (ACRI). H. Umeo et al. (Eds): ACRI 2008, Lecture Notes in Computer Science 5191, pp. 192-199, Springer-Verlag Berlin Heidelberg 2008.

- A. Caiazzo, J.L. Falcone, B. Chopard, A.G. Hoekstra. *Scale-Splitting Error in Complex Automata Models for Reaction-Diffusion Systems.* Proceedings of International Conference in Computational Science (ICCS), Lecture Notes in Computer Science 5102, part II, pp. 291-300, Springer-Verlag, Berlin Heidelberg 2008.

Book Chapters

- A. Caiazzo, I.E. Vignon-Clementel. Mathematical modeling of blood flow in the cardiovascular system. Chapter 2 in *Quantification of Biophysical Parameters by Medical Imaging*, Springer 2017 (in press).
- M. Natale, A. Caiazzo, E. Ficarra. A Novel Gaussian Extrapolation Approach for 2-D Gel Electrophoresis Saturated Protein Spots. Chapter 12 in *2D Page Map Analysis. Methods and Protocols*, Methods in Molecular Biology 1384 (Springer Protocols), Humana Press (2015).
- A. Caiazzo, M. Junk. Asymptotic Analysis of Lattice Boltzmann Methods for Flow-Rigid Body Interaction. Chapter 4 in *Novel Trends in Lattice Boltzmann Methods*, E-Book Series Progress in Computational Physics (PiCP), Volume 3 Bentham Science Publishers (Ed. M. Ehrhardt).
- A.G. Hoekstra, A. Caiazzo, E. Lorenz, J.-L. Falcone, B. Chopard. Complex Automata: multi-scale Modeling with coupled Cellular Automata. Chapter 1.4 in *Modeling of Complex Systems using Cellular Automata.* Eds: J.Kroc, P.M.A. Sloot, Springer 2010.

Other Publications

- A. Caiazzo et al., *Complex Automata: distributing simulations across scales*, Oberwolfach Report, workshop *Computational Multiscale Methods* (2009).