Publications

Doctoral Dissertation

Jain, K. (2016). *Transition to Turbulence in Physiological Flows: Direct Numerical Simulation of Hemodynamics in Intracranial Aneurysms and Cerebrospinal Fluid Hydrodynamics in the Spinal Canal*. PhD thesis, Universität Siegen, Germany.

Book Chapters

V. Kurtcuoglu, **Kartik Jain**, and B. A. Martin. Modelling of cerebrospinal fluid flow by computational fluid dynamics. In *Biomechanics of the Brain*, pages 215–241. Springer, 2019. doi: https://doi.org/10.1007/978-3-030-04996-6_9.

Articles in peer reviewed journals

Kartik Jain. Transition to turbulence in an oscillatory flow through stenosis. *Biomechanics and Modeling in Mechanobiology*, 19:113–131, 2020a. doi: https://doi.org/10.1007/s10237-019-01199-1. PMID:31359287.

Kartik Jain. Efficacy of the FDA nozzle benchmark and the lattice Boltzmann method for the analysis of biomedical flows in transitional regime. *Medical & Biological Engineering & Computing*, 58:1817–1830, 2020b. doi: 10.1007/s11517-020-02188-8. PMID:32507933.

Kartik Jain, J. Jiang, C. Strother, and K.-A. Mardal. Transitional hemodynamics in intracranial aneurysms - comparative velocity investigations with high resolution lattice Boltzmann simulations, normal resolution ANSYS simulations and MR imaging. *Medical Physics*, 43:6186–6198, 2016a. doi: http://dx.doi.org/10.1118/1.4964793. PMID:27806613.

Kartik Jain, S. Roller, and K.-A. Mardal. Transitional flow in intracranial aneurysms–a space and time refinement study below the Kolmogorov scales using lattice Boltzmann method. *Computers & Fluids*, 127:36–46, 2016b. doi: https://doi.org/10.1016/j.compfluid.2015.12.011.

Kartik Jain, G. Ringstad, P.-K. Eide, and K.-A. Mardal. Direct numerical simulation of transitional hydrodynamics of the cerebrospinal fluid in chiari I malformation: The role of cranio-vertebral junction. *International journal for numerical methods in biomedical engineering*, 33(9), 2017. ISSN 2040-7947. doi: doi:10.1002/cnm.2853. URL http://dx.doi.org/10.1002/cnm.2853. PMID:27863152.

K. Valen-Sendstad, A. W. Bergersen, others, **Kartik Jain**, and more. Real-world variability in the prediction of intracranial aneurysm wall shear stress: the 2015 international aneurysm CFD challenge. *Cardiovascular Engineering and Technology*, pages 1–21, 2018. doi: https://doi.org/10.1007/s13239-018-00374-2. PMID:30203115.

A. Wagner, E. Eggenweiler, F. Weinhardt, Z. Trivedi, D. Krach, C. Lohrmann, **Kartik Jain**, N. Karadimitriou, C. Bringedal, P. Voland, C. Holm, H. Class, H. Steeb, and I. Rybak. Permeability estimation of regular porous structures: a comparison of methods. *Transport in Porous Media (under review)*, 00:000–000, 2020. doi: 10.1007/s11517-020-00000-0.

Peer reviewed conference proceedings

V. C. Frostelid, **Kartik Jain**, A. Jensen, and K.-A. Mardal. Experimental investigation of transitional flow in cerebral aneurysms. 3(0):674 – 677, 2017. 2017 Computational and Mathematical Biomedical Engineering.

H. Klimach, **Kartik Jain**, and S. Roller. End-to-end parallel simulations with APES. In *Parallel Computing: Accelerating Computational Science and Engineering (CSE)*, volume 25 of *Advances in Parallel Computing*, pages 703–711, Munich, Germany, September 2014. IOS Press. doi: https://doi.org/10.3233/978-1-61499-381-0-703.

J. Qi, **Kartik Jain**, H. Klimach, and S. Roller. Performance evaluation of the LBM solver Musubi on various HPC architectures. In *Advances in Parallel Computing: On the Road to Exascale*, volume 27 of *Advances in Parallel Computing*, pages 807–816. IOS Press, March 2016. doi: https://doi.org/10.3233/978-1-61499-621-7-807.

Kartik Jain and K.-A. Mardal. Exploring the critical reynolds number for transition in intracranial aneurysms - highly resolved simulations below Kolmogorov scales. 3(0):560 – 563, 2015. 2015 Computational and Mathematical Biomedical Engineering.

Kartik Jain, S. Zimny, H. Klimach, and S. Roller. Thrombosis modeling in stented cerebral aneurysms with lattice Boltzmann method. In *Proceedings of the 26th Nordic Seminar on Computational Mechanics*, pages 206–209, Oslo, Norway, 2013.

S. Zimny, B. Chopard, O. Malaspinas, E. Lorenz, **Kartik Jain**, S. Roller, and J. Bernsdorf. A multiscale approach for the coupled simulation of blood flow and thrombus formation in intracranial aneurysms. *Procedia Computer Science*, 18:1006–1015, 2013. doi: https://doi.org/10.1016/j.procs.2013.05.266.

Selected Conference Presentations

Feb 20	9th International Bio-Fluid Mechanics And Vascular Mechanobiology Symposium, Tucson, USA
Nov 19	72nd Annual Meeting of the American Physical Society Division of Fluid Dynamics, Seattle, USA
Jun 19	eCM Conference on Orthopedic Infection, Davos, Switzerland
May 19	Interpore Conference, Valencia, Spain
Jun 17	International Conference on Computational Science, Zürich, Switzerland
Feb 17,18	Retreat of the SNSF - NCCR Kidney.CH in Murten, Switzerland
Jun 16	Platform for Advanced Scientific Computing, Lausanne, Switzerland
Sep 15	ECI conference on CFD in medicine and biology II, Albufeira, Portugal
Jul 15	ECCOMAS, Young Investigators Conference, Aachen, Germany
Jul 15	Computational and mathematical biomedical engineering, Cachan, France
Jun 15	Summer biomechanics, bioengineering & biotransport conference, Salt Lake City, Utah, USA
Jun 14	Intracranial Stent Meeting, Zürich, Switzerland
Oct 13	Nordic Seminar on Computational Mechanics, Oslo, Norway