Rajeev Jain

PRINCIPAL RESEARCH SOFTWARE SPECIALIST · ARGONNE NATIONAL LABORATORY CHICAGO· MATHEMATICS AND COMPUTER SCIENCE

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SUMMARY

I have 14 years of experience managing/developing software projects and two masters degree: one in computer science and other in structural enginneering. I like to learn new things, I am familiar with several programming languages and tools used to execute complex projects.

WORK EXPERIENCE

2018 – 2022

Principal Research Software Specialist, Mathematics and Computer Science   ARGONNE NATIONAL LABORATORY

⇒ Managed junior developers and completed software projects from conceptualization to actual coding.
⇒ Significantly reduced the time taken by domain scientists to launch and analyze large runs on super-computers.
⇒ Used our hyperparameter optimization on COVID-19 deep neural network (DNN) models and delivered improved results. Scripted big runs on HPC clusters.
⇒ Wrote reports and published papers in peer-reviewed journals and conferences such as the supercomputing conference.

2011 – 2018

Software Developement Specialist, Mathematics and Computer Science   ARGONNE NATIONAL LABORATORY

⇒ Handled the coupled urban exascale simulation project, lead a diverse team of experts from different national labs and universities.
⇒ My reactor generator tool was used by Kitware Inc. to write and get SBIR funding Phase 1 for $225k and Phase 2 for $750k for a 2 year period. They developed GUI and added some new features to the toolset.
⇒ Greatly improved the runtime and memory utilization of simulation codes by using distributed computing techniques and libraries.
⇒ Lead the developer of MeshKit, presented yearly updates to U.S. scientific funding agencies in the Washington D.C. office.

2009 – 2011

Pre-doctoral Appointee, Mathematics and Computer Science   ARGONNE NATIONAL LABORATORY

⇒ Gathered requirements and developed the scalable reactor geometry and mesh generation tool using C++.

2007 – 2009

Research and Teaching Assistant, Civil Engineering in the School of Sustainable Engineering and the Built Environment   ARIZONA STATE UNIVERSITY

⇒ Mentored students to solve structural engineering problems and graded assignements.
⇒ Wrote multidisciplinary, scalable code for running simulation jobs in distributed systems.

2006 – 2007

Project Engineer, SAP/Java   WIPRO TECHNOLOGIES, BANGALORE/HYDERABAD, INDIA

⇒ Complete Java programming course and worked on a mobile payment systems for Nokia (Bangalore)
⇒ 3 months training in SAP ABAP and started working in a project with Kodak (Hyderabad)

Summer 2005

Research Trainee, Engineering Research Division   TATA MOTORS, PUNE, INDIA

⇒ Performed hot and cold circuit automobile engine fitted with retarder.

SOFTWARE DEVELOPMENT PROJECTS

2020 – present

Co-Developer, UXarray   GITHUB LINK

Helped design and code the first draft of the UXARRAY API, wrote python functions to integrate and read/write unstructured grids.

2016 – present

Co-Developer, ECP-CANDLE   GITHUB LINK

Published papers on model robustness with counterfactuals / noise injection and hyper-parameter optimization framework "Supervisor". Currently focussed on testing claims made by the recent artificial inteligence (AI-based) cancer drug-response papers, creating a framework for understanding model sensitivity and XAI

| 2018 – present | **Co-Developer**, Flash-X | DOCUMENTATION |

Designed/coded asynchronous write and compression of HDF5 checkpoint file. Help with performance benchmarking on DOE supercomputers, CI, documentation. Review/manage GitHub policies, actions, PRs, issues etc.

| 2009 – 2016 | **Lead Developer**, MeshKit | BITBUCKET LINK |

Principal Investigator for MeshKit (mesh generation C++ toolkit) for the reactor geometry generation package (RGG). Wrote several mesh/geometry generation algorithms and published in peer-reviewed conferences/journals.

SELECTED PUBLICATIONS

1. **R. Jain**, A. Shah. J. Mohd-Yusof. et al."Probing Decision Boundaries in Cancer Data Using Noise Injection and Counterfactual Analysis." (2021)

2. **R. Jain**, K. Weide. S. Chawdhary. T. Klostermann. "Checkpoint/Restart for Lagrangian particle mesh with AMR in community code FLASH-X." *arXiv preprint arXiv:2103.04267* (2021)

3. **R. Jain**, X. Luo. G. Sever. T. Hong. C. Catlett. "Representation and evolution of urban weather boundary conditions in downtown Chicago." *Journal of Building Performance Simulation* 13, 182–194 (2020)

4. J. M. Wozniak. **R. Jain**, P. Balaprakash. et al."Candle/supervisor: A workflow framework for machine learning applied to cancer research." *BMC bioinformatics* 19, 59–69 (2018)

5. P. O'Leary. J. Becker. R. O'Bara. D. Thompson. **R. Jain**, et al."Providing a Graphical Tool for Modeling Reactor Cores." *Transactions of the American Nuclear Society* 118, (2018)

6. **R. Jain**, T. J. Tautges. "PostBL: Post-mesh boundary layer mesh generation tool." *Proceedings of the 22nd International Meshing Roundtable* 331–348 (2014)

7. T. J. Tautges. **R. Jain**, "Creating geometry and mesh models for nuclear reactor core geometries using a lattice hierarchy-based approach." *Engineering with Computers* 28, 319–329 (2012)

8. **R. Jain**, "Blast Mitigation solutions via FEM-Based Design Optimization." (2009)

HONORS

2010 – present	**Mentor**, Supervised several summer students/postdocs and staff members	ARGONNE NATIONAL LABORATORY
	NUMGRID 2020 **Invited: Program Committee Member**, Managed and reviewed papers	
2015	**Reviewer and Session Chair**	COMPUTATIONAL GEOMETRIES, SNA AND MC CONFERENCE
2015-2017	**Advisor and developer** Commercialization of RGG, click for details	KITWARE INC. FOR SBIR PHASE I AND II
2011	**Co-chair**	ARGONNE/CSUI UNDERGRADUATE/GRADUATE RESEARCH SYMPOSIUM.
2007 – 2009	**University Graduate Fellowship**, $4000	ARIZONA STATE UNIVERSITY
2004 – 2004	**1st Prize for Low Budget Car Design Contest**, INR 40k+	TECH FEST IIT KHARAGPUR AND MINDA LTD. DELHI

EDUCATION

2017 – 2020	**Masters of Science** Computer Science	UNIVERSITY OF CHICAGO
2007 – 2009	**Master of Science** Structural Engg. (Minor Computer Science)	ARIZONA STATE UNIVERSITY
	Thesis title: "Blast Mitigation solutions via FEM-Based Design Optimization."	
2002 – 2006	**B.Tech** Mechanical Engineering	IIT DHANBAD, INDIA

OTHER SKILLS AND ACTIVITIES

2012-present	**Mentor** School kids with STEM Mentoring Cafe
2011-2017	**Reviewer** International Meshing Roundtable (IMR).
2015	**Reviewer** SBIR (Small Business Funding Proposals)
2015	**ATPESC scholar** world-class training for selected applicants on HPC and big data
2017-present	**Member** Association for Computing Machinery (ACM) and American Nuclear Society (ANS).
	Following: Cricket, Biking, Table-tennis, Crypto-currencies and International affairs.