Rajeev Jain

Principal Research Software Developer · Argonne National Laboratory · Mathematics and Computer Science

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Summary

I have 14 years of experience managing/developing software projects. Over the years I have been working on a variety of fields from AI, Urban, Nuclear, Climate, Astrophysics and even Cancer, the common theme tying all these broad topics is computation, simulation and optimization. I am interested in software development, AI, blockchain and managing multi-disciplinary simulation/computation for applications-oriented problems.

Work Experience

2018 – 2022 **Principal Research Software Specialist**, Mathematics and Computer Science Argonne National Laboratory

- ⇒ Managed junior developers and also developed code for deep neural network (DNN) models in python.
- ⇒ Delivered new end-to-end functionality from conceptualization to actual coding.
- ⇒ Handled complex compute performance related issues and optimized code. Wrote distribute toolset for parallel applicatoins.
- ⇒ Authored a paper: "Supporting a Community of Cancer Models with the CANDLE Checkpoint Module", this enables a standard to way to save pytorch and tensorflow based checkpoint files for restarting DNN models.

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.
- ⇒ Lead the development of MeshKit, presented yearly updates to scientific funding agencies in Washington D.C. office.

2009 – 2011 **Pre-doctoral Appointee**, Mathematics and Computer Science Argonne National Laboratory

- ⇒ Presented my work in leading peer-reviewed conferences and also wrote funding proposals to the Department of Energy Offices.
- ⇒ Gathered requirement and built the reactor geometry and mesh generation tool.

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.

Summer 2004 **Trainee Process Engineer**, Research and Development Bhilai Steel Plant, Bhilai, India

- ⇒ Understood and learned testing of railway tracks, performed a study to find bottlenecks in the entire process.

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 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. Wrote several mesh/geometry generation algorithms and published in peer-reviewed conferences/journals.

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

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 **Mentor** Kitware Inc. for SBIR Phase I and II

Basis of this work was my tool RGG, click for details

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

Other skills and activities

1990-present **Cricket:** Playing and watching