Mir Abdullah AlMasud

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Summary

A results-oriented professional with ten years of scientific computing, software engineering, and project management experience. By pioneering a distributed and scalable testing and development environment, I helped Simcenter Nastran's development process transform to agile. I have managed big data migration projects for Caterpillar and Johnson Electric as a CAD/PLM data migration consultant. As a data science associate for materials science and engineering research consortiums, I established analytics pipelines and open-source toolkits to find new materials. I'm looking for a Data Science Software Engineering position to use my math and problem-solving skills and passion for novel applications.

Professional Experience

International Technegroup Inc. *February 2022 - Present*
PLM Consultant *Milford, OH*

- **Migration from ePDM Teamcenter** :
  I worked closely with the engineering divisions at Johnson Electric to understand their Product Lifecycle Management requirements and practices. Because ITI had no prior experience moving PLM data from a local server to the cloud, this project was a challenging one. I led the initiative to augment our in-house toolkit with Asynchronous, concurrent, and fault tolerance capabilities to handle the massive data volume. Based on what we learned from this project, ITI went on to launch multiple more cloud-based migration initiatives.

University of Kentucky *January 2022 - December 2023*
Data Science Research Associate *Lexington, Kentucky*

- **Computational modeling and Predictive Analytics**:
  The UKś Computational Material Science lab developed Kentucky Random Structures Toolkit (KRaSTk), a high-throughput method for generating and computing model representative volume elements (mRVEs) based on physics-based geometric seed descriptions that capture structural complexity. The toolkit uses Salome-mehca, gmsh and code-aster to design and solve complex problems in computational material science. I have added a predictive data analytics pipeline to this project that uses the scikit-learn and FAISS libraries in Python. The outcome of the project secured funding from multiple organisations for additional student researchers.

Siemens Digital Industries Inc. *April 2013 - February 2022*
Senior Software Engineer *Milford, OH*

- **AMQP-based Distributed System for Large testing suit**
  We used rabbitMQ and Python celery to establish a queue-based, distributed, and asynchonous test queueing system to replace the in house cookie-based QA system. With the same amount of machine resources, Nastran's DevOps team could process two times more build cycles at a given time. Multiple internal teams and processes adopted this strategy. The scale of its impacts earned me Siemens YouAnswered award in 2021.
- **SDLC dashboard for Simcenter Nastran**:
  Static webpages were refactored to improve responsiveness and dynamic nature. This dashboard required full-stack development, including PHP and Perl scripts on the back end, as well as MSSSQL and XML data stores. The goal was to increase the visibility of the Nastran DevOps team's actions, analytics, and communication between members of the development team and the build team.

- **Stabilizing Nastran Solver results** :
  Nastran's nonlinear and optimization solutions have long been renowned for their precision. However, the solvers created too much junk data, causing the tests to become unstable. To gain insight into these data, I polled the engineers, discovered root-causes , analyzed patterns, and wrote additional functions to separate and remove extraneous data from the results. A similar initiative was taken for the structural- and rotor-dynamics solvers to process data associated to rigid body modes. Almost 90% of all unstable cases stabilized, saving developers time and improving enthusiasm. This greatly increased the developers' productivity.
- **SCM migration**:
  I have contributed thousands of lines of code in Perl and Python to streamline the development process in Nastran during it's migration from clearcase-based development to perforce-based development. Nastran has gone through multiple such transitions in its 70 year history. I take pride in being part of one transition of this scale. My knowledge and expertise helped to bolster the transition of Nastran's acoustic team's migration from Mercurial to GitLab.

Education

M.S. in Data Science *2022 - 2023*
University of Kentucky
Project: Analysis of Large Language Model Performance in a Simulated Web Environment

M.S. in Engineering (Mechanical) *2010 - 2013*
Louisiana Tech University

B.Sc. in Mechanical Engineering
Bangladesh University of Engineering and Technology *2004-2009*

Awards

Siemens - YouAnswered in 2022

North American Society of Trenchless Technology - Best research presentation award 2012,2013

Technical Skills

Root cause analysis: performance and regression on solution sequences of nastran simulations.

Finite Element Method:Experience in developing and supporting finite element software codes.

Data Analytics: pandas,numpy,matplotlib, plotly, chart.js

Machine Learning tools: scikit-learn,imbalance-learn,keras,FAISS

Programming Expertise: Python, Perl, C and C++.

Distributed and Shared Memory Parallel programming: Intel MPI and Python multiprocessing/threading libraries.

Full Stack Software Development: Python and Perl with flask and php in the backend

Managing queues and streaming in distributed systems: Celery API and RabbitMQ.