Mir Abdullah AlMasud

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Summary

For the past ten years, I have worked as a professional in the fields of scientific computing, software engineering, and technical consulting. I've created and managed testable FEM programs, automated testbeds, and distributed and scalable applications for Simcenter Nastran development. As a CAD/PLM data migration consultant, I led projects for Caterpillar, Baker-Hughes, and Johnson Electric that involved data conversion from ePDM/Windchill to Teamcenter. As a data scientist, I set up predictive analytics pipelines for material scientists and FE analysts.

Professional Experience

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

- **Migration from ePDM to Teamcenter** :
  Worked closely with engineers at Johnson Electric to understand their product lifecycle management practices. I led the initiative to augment ITI's in-house toolkit with asynchronous, concurrent, and fault tolerance capabilities to handle the massive data volume. This was my team's first migration to cloud project. Based on what we learned from this project, ITI went on to launch multiple cloud-based migration initiatives.

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

- **AMQP-based Distributed System for Large testing suit**
  Used AMQP and Python APIs' to establish a queue-based, distributed, and asynchronous task queueing system to replace the in house cookie-based QA system for analyzing Nastran simulation data. Nastran's product delivery frequency doubled. Multiple internal teams and processes adopted this strategy. The scale of its impacts earned me the 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, MSSSQL and XML as data stores. The goal was to increase the visibility of the Nastran DevOps team's actions, analytics, and streamline communication between members of the development team and the DevOps team.

- **Stabilizing Nastran Solver results** :
  Nastran's nonlinear and optimization solvers created too much junk data, causing the tests to become unstable. To gain insight into this 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 extraneous data associated with 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 written dozens of automation tools in Perl and Python to aid the development process in Nastran during its migration from clearcase-based development to perforce-based development.

Part-time Research Experience

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

- **Computational modeling and predictive analytics**:
  The UK´s material science labs developed a Toolkit that uses Salome-mehca,gmsh and code-aster capabilities to design and solve complex problems in computational material science. I have added a predictive data analytics pipeline to this project. The outcome of the project secured funding from multiple organizations for more research initiatives.
- **Evaluating Performance of LLM agent**:
  Built multiple web environments using flask and sqlite, to facilitate research and evaluate performance of large language model (LLM) agents.

Education

M.S. in Data Science *2022 - 2023*
University of Kentucky

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

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

Certificates and Awards

Microsoft - Certified Azure AI Fundamentals (AI-900) January 2024
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: R, SAS, pandas,numpy,matplotlib, plotly, chart.js
Machine Learning tools: scikit-learn,imbalance-learn,keras,FAISS
Programming Expertise: Python, Perl, C
Distributed and Shared Memory Parallel programming: Intel MPI and Python multiprocessing/threading libraries.
Web Development: flask and php in the backend
Big Data and distributed systems: Celery API and RabbitMQ,PySpark
Database: SQLite, MSSQL,MongoDB,OrientDB