Athul Chakkithara Dharmarajan

@ achakkit@purdue.edu | in LinkedIn | ♀ West Lafayette, Indiana

EDUCATION

Purdue University West Lafayette, Indiana
PhD in Mechanical Engineering *Aug '22 – Present*
Advised by Prof. Jitesh Panchal

Indian Institute of Technology Bombay Mumbai, India
Bachelor of Technology and Master of Technology in Mechanical Engineering *Aug '17 – Jun '22*

CONFERENCE PRESENTATIONS

- Theory-Grounded Guidelines for Solver-Aware System Architecting (SASA)
  System Engineering Research Center (SERC) Doctoral Student Forum, November 2022

- A Function Selection-Based Framework for Representing Extreme Novelty in Models of Design Processes
  Poster Session at the 9th International Engineering Systems Symposium: CESUN 2023, November 2023

RESEARCH EXPERIENCE

Theory-Grounded Guidelines for Solver-Aware System Architecting (SASA) Aug '22 -
Funded by National Science Foundation, The Engineering Design and Systems Engineering (EDSE) Program
- Developed a model for early stage design evaluation capable of comparing a wide range of solvers with varying expertise
- Planning to use this knowledge to come up with heuristics to decompose and assign the sub problems to solvers with different expertise to satisfy different objectives

Design of a Multi-Agent Paradigm for Disaster Management May '21 – Jun '22
Master's Thesis with Prof Dwaipayan Mukherjee and Prof Anirban Guha
- Developed a novel scheme to assign area equitably among agents in coverage of a non linear environment
- Developed a collaborative path planning scheme to achieve the optimal configuration withou a central coordinator

PROJECTS

Generating Designs using Denoising Diffusion Probabilistic Models(DDPM) in JAX (Ongoing)
- Developing a JAX implementation of the DDPM model for generating ship hull designs proposed in ShipGen by DeCoDe Lab at MIT

Predicting Sales Using Machine Learning based Time Series Forecasting
- Predicted sales of products in Walmart Stores across USA using time series forecasting techniques comparing ARIMA, a Statistical model and LGBM, a modern Gradient Boosting based method

Path Planning using Parallel Computing
- Implemented Dijkstra's, Floyd-Warshall and Bellman-Ford Algorithm, popular frameworks for path planning, using using parallel computing techniques like CUDA, OpenMP and MPI

Clean Power Generation using Friction
- Proposed a prototype mechanism for generating energy from friction generated on highways

RELEVANT COURSEWORK

Graduate Level: Advanced Scientific Machine Learning, Data Mining, Design and Analysis of Robotic Mechanisms, Engineering Design: A Decision-Based Approach

SKILLS

Programming: C, C++, Python, MATLAB, R | **Technologies:** Git, Arduino, ROS, Simulink