Abhiroop Ghosh

abhiroopghosh.com | linkedin.com/in/abhiroopghosh | github.com/abhiroopghosh71 | Google Scholar | ORCID

EDUCATION

Michigan State University — East Lansing, MI, USA
PhD in Electrical and Computer Engineering — *Jan. 2018 – Dec. 2022*
CMSE Graduate Certificates in High Performance Computing and Computational Modeling

Jadavpur University — Kolkata, WB, India
Bachelor of Electrical Engineering (BE) — *Aug. 2012 – July 2016*

EXPERIENCE

Senior Software Developer — Jan. 2023 – Present
Aspen Technology (formerly Open Systems International) — *Medina, MN, USA*
- Developed three software applications for generation management systems and electricity markets such as ERCOT.
- Formulated and solved constrained mixed-integer and non-linear optimization problems with over 10,000 variables.
- Integrated existing products with commercial solvers like Gurobi and CPLEX using C and Python APIs.
- Researched methods to mathematically model energy storage and renewable resources in power dispatch problems.

PhD Research Assistant — Jan. 2018 – Dec. 2022
Michigan State University — *East Lansing, MI, USA*
- Research areas: multi-objective optimization, meta-heuristics, operations research, machine learning.
- Delivered three multi-year industry research projects from ideation to implementation.

PhD Teaching Assistant — Jan. 2021 – May 2021
Michigan State University — *East Lansing, MI, USA*
- Designed undergraduate course materials, trained three student sections, managed a lab, and graded assignments.

AI-driven Design Exploration Intern — May 2019 – Aug. 2019
Siemens — *Princeton, NJ, USA*
- Created a multi-level optimization architecture to optimize cost and reliability of a battery-based microgrid.
- Boosted projected 10-year rate of return on energy storage investments to over 40%.

Project Engineer - AI & Cognitive Computing — July 2016 – Nov. 2017
Wipro Digital — *Bengaluru, KA, India*
- Developed AI-based handwritten text detection software to automate the processing of pharmacovigilance forms.

PROJECTS

Optimization Visualizer | *Python, Plotly, Dash, HTML, CSS, Git* | *github.com/abhiroopghosh71/IK-EMO-Visualizer*
- Developed a full-stack web application with nine interactive widgets using the Dash framework.
- Implemented interactive 2-D and 3-D scatter plots, parallel coordinates plots, graph structures.
- Designed regression models to obtain hidden inter-variable relationships among optimal solutions.

Solid Rocket Design Optimization | *C, Python, Cython, Git* | github.com/abhiroopghosh71/solid-rocket-design-optimization
- Engineered a multi-objective optimization framework to solve a large-scale solid rocket motor design problem.
- Achieved a 30% improvement in solution quality compared to the state-of-the-art on datasets provided by NASA.

TECHNICAL SKILLS

Languages: C/C++, Python, MATLAB, HTML, CSS.
Libraries: Jupyter Notebook, NumPy, Pandas, Scikit-learn, Matplotlib, Plotly, Dash, h5py, Cython.
Developer Tools: Git, SVN, VS Code, Visual Studio, PyCharm, GitHub Actions CI, Jenkins, unittest, pytest, CUnit.
Optimization: CPLEX, GUROBI, HEEDS, CVXPY, COIN-OR.
Others: Linux, High-Performance Computing (HPC), HDF5, Object-oriented programming, Agile workflow, LaTeX.

PUBLICATIONS AND PEER REVIEW

- 4 journal and 6 conference publications (718 citations as of September 2024).
- 22 reviews for 5 journals.