PAWAN SUTAR

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SUMMARY

Mechanical Engineering Graduate with strong research acumen, polished programming skills and huge interest in Fluid Dynamics, Control and System Engineering and Numerical Algorithm Development. Demonstrated ability to contribute to positive workplace culture. In search of a challenging, growth-oriented technical development opportunity.

EXPERIENCE

Graduate Research Assistant, Combustion and Propulsion Research Laboratory at IUPUI *Jan 2019 - Present*

- Master's Thesis: Numerical Simulation of Pocket Combination for Extension for Speed and Load Range of Wave Rotor Pressure Wave Supercharger
- Parameterization- Controlled parameterization and techniques to impose boundary conditions for numerous wave rotor configurations, thereby enabling rapid error-free one-dimensional simulations.
- Validation- Simulated basic unsteady flow processes using numerical tools implemented in FORTRAN and verified accuracy of tools for their analytical solutions and experimental results.
- Simulation- Programmed modules in FORTRAN to simulate wall-pockets in wave rotors and identify their effects on off-design performance. Simulated various wave rotor configurations including WR Pressure-Wave Exchanger (COMPREX), Pressure Divider, COMPREX with wall pockets and Wave Turbines.
- Post-processing- Developed post-processing script in MATLAB to visualize flow field, shock and expansion waves, mass flow rates, pressure and temperature distribution, Mach number and velocity profile.
- Optimization- Eliminated hard-coded modules from programs by organizing subroutines and defining parameters. Designed efficient flow models by phase-shifting approach for correct shock incidences and avoiding back-flows.
- Laboratory Management- Supervised Computational Research Program. Led cross-functional collaboration between computational and experimental teams. Responsible for analysis of acquired information, preparing and finalizing reports, reviewing technical papers and manuscripts and other administrative and research duties per professor request.
- *Accomplishments: Reduced dependency on expensive CFD software by developing user-friendly MATLAB script with user input dialog box. Automated modeling calculation process by creating an Excel sheet.

Energy Engineering Intern, Industrial Assessment Center at IUPUI *Sep 2018 - May 2019*

- Performing energy audits for small and medium sized companies (ASHRAE Level 1&2 audits)
- Metering and analyzing plant energy consumption by collecting data from site and utility bills
- Finding energy saving opportunities and intelligent usage techniques by analyzing mechanical and electrical systems
- Calculating and estimating cost, payback period and rate of return for each Energy Management Opportunities (EMO)
- Writing and editing official reports including plant and process description, resource charts and tables, major energy consuming equipment and best practices and description of individual EMO
- *Accomplishments: Participated in four industrial energy audits, contributed to the energy cost saving of over $50,000

PROJECTS

Two-Stroke Free Piston Linear Engine for Electricity Generation

- Planned and executed comprehensive research strategies to develop prototype 5 kW FPLG. Replaced crank-case compression by building auxiliary compression chamber, set-up fuel system, installed data acquisition system, oil sealing and electrical components. Device is currently under development at the College of Engineering, Pune.

Pump Station Peak Shaving PERL Project

- Evaluated cost benefits of using peak-shaving generators for Indianapolis Citizens Energy Group's DigIndy Tunnel dewatering pump station by analyzing electricity usage data of 3 years.

CFD and FEA Domain

- Pressure-loss Analysis of Cummins 6-cylinder Exhaust Manifold, FEA Analysis of Race Car Upright, CFD simulation of Wave Rotor wall-pockets, Flow Systems and Conjugate Heat Transfer CFD

Data Analysis Domain

- Design of a system to read client data and build a set of unique professionals to be approached for marketing campaign
- Employee data manipulation and analysis to rationalize employee cost to save payroll budget
- Development of a Decision Making Model for a fashion company using Linear Regression Algorithm

EDUCATION

Master of Science in Mechanical Engineering, *Aug 2018 - Dec 2020*
Purdue University, Indianapolis **GPA: 3.45**

SKILLS

Programming Languages: PYTHON, FORTRAN, UNIX/LINUX OS
Engineering Software: The MathWorks MATLAB, The MathWorks Simulink, ANSYS Fluent, ANSYS Workbench
Project Management Tools: MS Office Suite, GitHub, SCRUM Fundamentals Certified
Certifications: PYTHON for Data Science Professional, MATLAB for Scientific Computing (MathWorks)