SURYAPAVAN CHERUKU

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EDUCATION

Texas A&M University, College Station, TX, United States. **Aug'21 – May'23**

Master of Science (Thesis) in Mechanical Engineering, CGPA: 4.0/4.0

Courses: Advanced product design, Modeling and analysis of Mechanical Systems, Emerging Human sensing Technologies, Multi-disciplinary System Analysis and Design Optimization, Advanced Computer-Aided Engineering

CVR College of Engineering, Hyderabad, Telangana, India. **Aug'17 – Jul'21**

Bachelor of Technology in Mechanical Engineering, CGPA: 9.32/10

Courses: Automobile Engineering, Computational Mathematics, Production Technology, Mechanics of Solids, Theory of Machines, Design for manufacturing, Industrial management, Machine Tools and Metrology, Finite Element Methods

COMPETENCIES

Skills: Machine Learning, Deep Learning, Statistical Analysis, Finite Element Analysis (FEA), Project Management, Design for Manufacturing & Assembly (DFMA), Structured Query Language (SQL), Geometric Dimensioning and Tolerancing (GD&T)

Software: Python, MATLAB, C programming, SQL Lite Studio, Solid works, AutoCAD, Ansys, Minitab, Design Expert, Origin Pro, XLTRC2

PROFESSIONAL EXPERIENCE

Graduate Research Assistant, Texas A&M University **Jan'22-Present**

- Working on developing a cyber-physical system for visualization of rotating machine's vibrational behavior in real time through functional information extraction using reduced order models and continuous data transmission.
- Derived reduced-order models from high fidelity models using classical machine learning (Decision trees, Random Forests) and deep learning (Neural networks) algorithms for health monitoring and diagnostics of a rotordynamic machine with human intervention.
- Designed and created a digital twin for a rotor kit using MATLAB to generate the required amount of synthetic data for unbalance faulty condition based on the defined parameter space.
- Tested the feasibility of using reduced-order models in understanding the dynamics of the machine and successfully predicting the characteristics of the faulty condition.
- Conducted real-time experiments on a physical machine to validate the results.

Student Worker, Texas A&M University **Oct'21 – Jan'22**

- Worked on fabrication and optimization of liquid crystal (LC) shutters to enhance occupancy detection of passive infrared sensors (PIR).
- Fabricated several LC shutters and performed data analysis in MATLAB to observe the variation in performance and effect of different input factors.
- Led to improvement in the performance of the shutters by 40%.

Research Trainee, CVR College of Engineering, India **Sept'19 – Jul'21**

- Conducted different machining experiments (hard turning, wire electrical discharge machining) for modeling and optimizing the workpiece quality and machining processes.
- Trained different machine learning algorithms using MATLAB tools and Scikit learn packages with experimental data to predict the machining responses such as surface roughness, tool wear, material removal rate (MRR), etc. Optimized the machining process using genetic algorithms and led to improvement in the surface quality of workpieces.
- Developed surrogate models using response surface methodology for generating the input-output relation in complex machining processes.

PROJECTS

Beam Engine Mechanism-based Indentation for Drilling Applications **Jan'22 – Apr'22**

- Designed and fabricated a beam engine mechanism that ensures perfect vertical punch for creating a dent before drilling operation.
- Generated parts and assembly of the mechanism using solid works and performed tolerance analysis at critical areas.
- Fabricated the final assembly with sheet metal, ¼" and ½" schedule 40 steel pipes, tubes, PLA material, bearings, and barrels using various operations such as Wire EDM, water jet cutting, drilling, milling, welding, and 3D printing.

Multi-objective optimization in wire electrical discharge machining of Ti-6Al-4V alloy by machine learning and statistical approach **Jan'21 – Jul'21**

- Modeled and optimized wire electrical discharge machining process (WEDM) by conducting real-time experiments and performing machine learning (neural networks, genetic algorithms) and statistical analysis.
- Demonstrated the need to use machine learning for understanding the nonlinearity involved in machining processes and avoiding costly time-consuming experimental runs.
- Won a gold medal for the best undergraduate final year project among all the departments.

PUBLICATIONS

- Paturi, U. M. R., **Cheruku, S.,** Reddy, N.S. The Role of Artificial Neural Networks in Prediction of Mechanical and Tribological Properties of Composites—A Comprehensive Review. Archives of Computational Methods in Engineering (2022). https://doi.org/10.1007/s11831-021-09691-7
- Paturi, U. M. R., Reddy, N.S., **Cheruku, S.,** Narala, S. K. R., Cho, K. K., Reddy, M. M. Estimation of coating thickness in electrostatic spray deposition by machine learning and response surface methodology. Surface and Coatings Technology (2021). https://doi.org/10.1016/j.surfcoat.2021.127559
- Paturi, U. M. R, **Cheruku, S.,** Pasunuri, V. P. K, Salike, S., Reddy, N. S., Srija. Machine learning and statistical approach in modeling and optimization of surface roughness in wire electrical discharge machining. Machine Learning with Applications (2021). https://doi.org/10.1016/j.mlwa.2021.100099.