

Phani Raja Bharath Balijepalli, PMP®

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Professional Summary

Engineering professional with an M.S. in Modeling & Simulation and 9+ years of experience across aerospace, renewable energy, telecommunications, and oil & gas sectors. PMP-certified with strong expertise in system reliability, failure analysis, and data-driven asset performance optimization. Experienced in developing simulation-based models for risk assessment, predictive maintenance, and lifecycle evaluation of complex engineering systems. Combines hands-on manufacturing and quality systems experience (API Q1, MIL-STD, ISO 9001) with statistical modeling, Monte Carlo simulation, and machine learning techniques to improve system robustness and operational availability.

Work Experience

Graduate Teaching Assistant, University of Central Florida

Aug–Dec 2025

Orlando, United States

- Supported instruction for the *Perspectives in Modeling and Simulation* course by leading and supporting lab demonstrations in Discrete Event, Continuous, and Agent-Based Simulation, and providing troubleshooting and scaffolding support for student simulation models.
- Managed Canvas LMS content delivery and grading for 29 students across multiple simulation paradigms.
- Designed project management template adopted by 100% of students for capstone simulation projects.

Manager, HCL Technologies

Jan–Jul 2024

Bengaluru, India

- Led cross-functional analytics and resource teams supporting U.S. telecom operations during a major transition.
- Managed transition training for 28 resources during a large-scale operational handover, achieving a 100% certification pass rate and supporting stable post-handover operations with zero service disruption.
- Implemented KPI-driven reporting and deployment frameworks to streamline operational reviews.

Project Manager, StartupCrafters

Sep 2022–Jan 2024

Hyderabad, India

- Led cross-functional coordination across mechanical, embedded, and software teams to develop an IoT medical device MVP.
- Resolved React–BLE integration challenges through technical alignment between application and embedded teams.
- Delivered a working MVP demonstration unit to U.S. stakeholders, supporting technical validation.

Senior Engineer - QA/QC, ICOMM Tele Limited

Dec 2019–Sep 2022

Hyderabad, India

- Led reliability-focused quality assurance for MIL-grade EMI/EMC enclosures and Oil & Gas Category B/C manufacturing in compliance with API Q1, ensuring structural integrity and operational durability in harsh environments.
- Directed product qualification and environmental stress validation, including EMI/EMC, shielding effectiveness (MIL-STD-801, MIL-STD-461, IEEE 299), and dimensional/material verification to assess failure risks and ensure system robustness prior to deployment.
- Oversaw welder qualification (ASME Section IX, AWS D1.2) and coordinated NDT Level II inspections (VT, PT, UT, RT, MT) to detect structural discontinuities and mitigate in-service failure risks, achieving zero non-conformances in third-party and customer audits.

Quality Associate, Mytrah Energy India Pvt. Limited

Jun 2016–Dec 2018

Hyderabad, India

- Executed Advanced Product Quality Planning (APQP) for 300 MW solar tracker structures, performing inspection of 200+ tonnes of structural steel and ancillary equipment.
- Implemented inspection protocols and supplier quality controls, reducing vendor defect rates and improving throughput by approximately 20%.

Project Associate, KV Solar Energy

Apr 2015–May 2016

Hyderabad, India

- Performed feasibility studies and technical design for solar energy projects using AutoCAD and SolidWorks for system layouts and structural components.
- Conducted site assessments and prepared engineering documentation supporting project proposals and client presentations.

Graduate Apprentice, ISRO – Satish Dhawan Space Centre
Sriharikota, India

Mar 2014–Mar 2015

- Designed molds and fixtures for composite propellant casting operations ensuring dimensional accuracy and process repeatability.
- Supported solid rocket motor handling operations including EOT crane operations, platform folding mechanisms, and tilting procedures.

Research Projects

Traffic and Weather-Driven Hybrid Digital Twin for Bridge Monitoring

Primary Author

Git Repository: shorturl.at/XBmCx

- **Full paper accepted for the *IABMAS 2026* conference.**
- Developed a sensor-light hybrid digital twin combining traffic cameras, weather APIs, and LWR-based traffic flow simulation for bridge condition monitoring.
- Integrated YOLOv8 vehicle detection with fatigue accumulation and reliability proxies using Random Forest-based estimation and Monte Carlo simulation.
- Generated probabilistic risk indicators for maintenance screening and inspection prioritization.

Climate-Aware Modeling for Energy-Efficient Data Center Workload Routing

Primary Author

Live application: shorturl.at/q0oQb

Git Repository: shorturl.at/R11hj

- Proposed a novel climate-aware, simulation-based framework integrating real-time weather data to support AI workload routing decisions across geographically distributed data centers.
- Developed physics-informed ML models (MLR, Bayesian-optimized ANN; $R^2 \approx 0.99$) for energy and thermal response estimation and evaluated routing policies using Monte Carlo simulation under stochastic weather and demand.
- Demonstrated reduced peak localized thermal accumulation with minimal impact on overall energy efficiency; manuscript under review at *ANNSIM 2026*.

Bayesian Zero-Inflated Negative Binomial Spatio-Temporal Modeling and Geosimulation for NYC Taxi Demand

Co-Author

- Contributed to a Bayesian ZINB spatio-temporal model with NNGP structure for scalable urban demand inference.
- Supported Pólya-Gamma data augmentation, SVD-based Gibbs sampling, and geosimulation for counterfactual scenario analysis.
- Manuscript under review at *ACM Transactions on Spatial Algorithms and Systems*.

Education

Master's, Modeling and Simulation, University of Central Florida
CGPA: 4.0

Dec 2025

Orlando, Florida

Bachelor's, Mechanical Engineering (WES Verified), JNTU
CGPA: 3.4

May 2013

Hyderabad, India

Software & Skills

Simulation & Modeling: AnyLogic, FlexSim, @Risk

Programming Languages: Python

Quality & Standards: MIL-STD-801, MIL-STD-461, IEEE 299, ISO 9001:2015, ASME Section IX, AWS D1.2

Design & CAD: AutoCAD, SolidWorks

Project Management: MS Project

Certifications

- Project Management Professional (PMP) – PMI
- ASNT NDT Level II Certifications: Visual Testing (VT), Penetrant Testing (PT), Ultrasonic Testing (UT), Radiographic Testing (RT), Magnetic Particle Testing (MT)
- ISO 9001:2015 Lead Auditor
- Digital Technologies and the Future of Manufacturing – University of Michigan
- Lean Six Sigma Green Belt