

# Phani Raja Bharath Balijepalli, PMP®

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## Professional Summary

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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

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**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.

- 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

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### Traffic and Weather-Driven Hybrid Digital Twin for Bridge Monitoring

*Primary Author*

Git Repository: [shorturl.at/XBmCx](https://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](https://shorturl.at/q0oQb)

Git Repository: [shorturl.at/RI1hj](https://shorturl.at/RI1hj)

- 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

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**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

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**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

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- 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