

Phani Raja Bharath Balijepalli, PMP®

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Professional Summary

PMP-certified digital engineering and modeling & simulation professional with an M.S. in Modeling & Simulation and 9+ years of engineering experience across aerospace, energy, telecommunications, and industrial systems. Experienced in digital twin development, system-level simulation, Python-based analytics, and applied AI/ML for predictive modeling, computer vision, and engineering decision support.

Work Experience

Research Assistant, Urban Digital Twin Lab

Feb 2026 – Present

University of Central Florida, Orlando, FL

- Presented a GeoAI-assisted urban flood intelligence demonstration during the 2026 UF/FL-ASPRS Spring Geospatial Workshop, integrating geospatial data, simulation workflows, and infrastructure risk visualization concepts.
- Curated instructional content and co-developing a book chapter on GeoAI applications in disaster management under an IEEE research grant.
- Developing digital twin and system-level simulation models to support scholarly publications and pedagogy research in Modeling & Simulation.

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 quality assurance for MIL grade EMI/EMC enclosures and Oil & Gas Category B/C manufacturing in compliance with API Q1 requirements.
- Managed product qualification activities, including coordination of environmental, EMI/EMC, and shielding effectiveness testing (MIL-STD-801F, MIL-STD-461, IEEE 299), along with dimensional inspection and verification, material qualification, and QA documentation (QAP, QTP, ATP).
- Conducted fault and root cause analysis using 7 QC tools and 8D tools for failures and provided mitigation plans.
- Oversaw welder qualification to ASME Section IX and AWS D1.2 standards and coordinated NDT Level II inspections (VT, PT, UT, RT, MT), achieving zero non-conformances across 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 inspec-

tion of 200+ tonnes of structural steel and ancillary equipment.

- Established inspection protocols and supplier quality controls, which decreased vendor defect rates and boosted throughput by around 20% through root cause analysis.

Project Associate, KV Solar Energy
Hyderabad, India

Apr 2015–May 2016

- 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

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

Primary Author

Live application: <https://ai-assisted-data-center-prompt-routing-dnphoafjvrystlnfownda9.streamlit.app/>

Git Repository: <https://github.com/Phani-Raja-Bharath/AI-assisted-Data-Center-prompt-routing>

- **Full paper accepted for the *ANNSIM 2026* conference.**
- 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.

Traffic and Weather-Driven Hybrid Digital Twin for Bridge Monitoring

Primary Author

Git Repository: <https://github.com/Phani-Raja-Bharath/Bridge-Digital-Twin-using-OpenCV-LWR>

- **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.

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
- **Design & CAD:** AutoCAD, SolidWorks

Certifications

- Project Management Professional (PMP) – PMI
- ASNT NDT Level II
- ISO 9001:2015 Lead Auditor
- Lean Six Sigma Green Belt