

## RAGHU VAMSI KODABOINA

### PROFILE SUMMARY

- Senior Powertrain Engineer with 16 years of experience in powertrain development, 1D simulation, and thermal management across passenger cars and REEV systems.
- Industry experience with global OEMs and research institutions, delivering simulation-led engineering solutions from concept through validation.
- Expert in GT-suite, Ricardo Wave, MATLAB/Simulink, and Python with strong capabilities in engine performance optimisation, emission reduction, and thermal system management and analysis.
- Experienced in high- and low-fidelity modelling, verification and validation, MBSE, MiL, powertrain packaging, DVP / DFMEA and BOM for conventional and electrified systems (including components and sub-systems).
- End-to-end project execution, including technical planning, milestone setting, stakeholder alignment, and delivering high-quality technical reports.
- Published author in international journals and conferences in waste heat recovery (WHR), hybrid systems, hydrogen engines, and fuel cell technologies.
- Experience in neural networks and meta-modelling to develop fast-running predictive models, with a solid foundation in machine learning and AI methods.

### CORE SKILLS

- Software Tools: GT-Suite, Ricardo Wave, MATLAB/Simulink, AMESim, Teamcenter, AVL Boost, CATIA V5R16, Python, SCILAB, Simscape, Saber, AVL Concerto, Pro-E, MS Office
- Technical Skills: V-cycle, 1D simulation modelling, MBSE (Model-Based Systems Engineering), MiL, vehicle testing and validation, engine and emissions optimisation, hybrid & fuel cell powertrains, thermal system design, transmission modelling
- Advanced Modelling & AI: Neural Networks, Meta-Modelling, Predictive Modelling, fast-running simulation models, data analysis
- Professional Skills: Project management, team leadership and mentoring, cross-functional collaboration, stakeholder communication, interdisciplinary coordination

### WORK HISTORY

**Research Specialist**, Clean Energy Research Platform, KAUST, KSA | Nov 2021 – Nov 2025

- Led simulation and research projects on SOFC-GT hybrid systems and advanced waste heat recovery, to advance clean, alternative, and sustainable energy technologies.
- Overall system was improved by 10 to 11% of heat recovery using the e-generator.
- Developed and validated 1D simulation models for hydrogen, diesel, and hybrid engines to enhance fuel efficiency, emission performance, and thermal management.
- Collaborated with multidisciplinary teams and partners (AVL, Scribner, Horiba) to define research requirements and secure funding approvals for the FC test facility.
- Optimized procurement strategy, reducing overall costs by 15 – 18%.
- Executed detailed project planning, milestone scheduling, and progress tracking for test cell facility setup, accelerating delivery by 6 months.
- Technical findings enabled the identification of opportunities in Fuel cell research.
- Delivered and published research findings in major technical conferences, contributing to advancements in sustainable powertrain and energy systems.

**Researcher – Advanced Powertrain Development**, Institute of Advanced Automotive Propulsion Systems (IAAPS) – Bath, United Kingdom | Aug 2019 – Jan 2021

- Established dynamic analysis and optimization models for GDI engines with ECU controls for Ford Motors UK, improving fuel efficiency by 3%, reducing NOx emissions by 3% and enhancing transient torque response by 4%.
- Executed large Design of Experiments (DoE) studies with turbocharger parameter variations to optimize combustion performance and emission compliance.
- Integrated thermal-performance models with engine simulations, delivering a 5% system-level efficiency improvement.
- Led development of meta-modelling approaches to reduce computation time from days to hours, maintaining accuracy, enabling faster prototype testing and calibration.
- Teamed up with consortium partners, stakeholders, and multidisciplinary teams to define technical requirements and communicate research milestones.
- All technical findings were documented to support project transparency, knowledge transfer, and the development of future hybrid and sustainable powertrain technology.

**Technical Lead – Powertrain Thermal Systems**, ZF India Pvt Ltd. - Hyderabad, India | Oct 2018 – Jul 2019

- Performed heat-impact analysis, achieving a 2°C reduction in thermal load during parking cycles, improving system reliability and component life.
- Designed thermal-management strategies for steering and powertrain components, optimizing cooling performance and lowering system operating temperature.
- Managed simulation model variants and conducted thermal analysis using SCILAB and MATLAB/Simulink.
- Cooperated with cross-functional teams in India and Germany to define requirements, plan project phases, and deliver technical results.
- Documented technical findings and reported project progress to support decision-making and future powertrain research initiatives.

**Assistant Manager and Senior Powertrain Engineer**, Renault Nissan Technology Business Centre India Pvt Ltd - Chennai, India | Jan 2014 – Oct 2018

- Developed and validated 1D/0D powertrain system models for IC, hybrid, PHEV, and BEV architectures, improving modelling accuracy and reducing calibration time by 15%.
- Integrated engine, transmission, aftertreatment, HVAC, and thermal systems to optimize vehicle performance and emissions under regulatory requirements.
- Designed turbocharger and energy management models contributing to a 5% efficiency improvement in hybrid EV prototypes.
- Led execution of cold-start emissions and MIL modelling and validation, resolving hardware-software integration gaps and improving vehicle-level verification and validation robustness.
- Collaborated with controls teams, suppliers, and global R&D groups to define specifications, align technical solutions, and improve simulation workflows.
- Supported PHEV strategy development by identifying research opportunities in advanced powertrain control and thermal-electrical integration.
- Planned project milestones, prepared technical reports, and presented results to stakeholders to ensure alignment with program goals.

**Senior Engineer – Powertrain Modelling**, Nissan Technical Center - Tokyo, Japan | Dec 2011 – Dec 2013

- Designed and validated CVT thermal models, achieving a 10% improvement in fuel economy by reducing friction-induced heat losses.
- Optimized cooling strategies for IGBT modules and battery systems, reducing thermal loading and increasing HEV/BEV range by 5%.
- Improved HEV/PHEV thermal and energy-management models, delivering a 3% fuel-economy gain through optimized heat-rejection strategies.
- Cooperated with mechanical and controls teams to integrate thermal models with hardware-software systems for accurate vehicle-level simulation.
- Conducted root-cause analysis of thermal issues to enhance component reliability.
- Prepared technical reports and presented results to stakeholders, supporting future hybrid and electrified powertrain development.

**CAD Design Engineer (Consultant)**, Ford Technical Services India | Jan 2011 – Dec 2011

- Executed 2D/3D design and comprehensive vehicle packaging for global programs (US, EU, China) using CATIA V5, WERS, and VPE; collaborated with Ford USA leadership to validate digital mockups and streamline Teamcenter workflows.

## EDUCATION

**MSc Automotive Engineering, Chalmers Tekniska Hogskola, Sweden | 2010**

- Thesis: Hybrid Powertrain for Auto-rickshaw
- Projects: Chalmers Eco Marathon (Automotive Project) and Atkinson Engine CAD

**BE Mechanical Engineering (Honors), Anna University, India | 2005**

- Thesis: Vibration Study on Disc Brakes and Effect of Squealing
- Industrial Report: Nuclear Waste Storage and Impact on Environment (2003)

## PUBLICATION / PRESENTATION

- A Joule cycle-based approach to recover waste heat from marine and heavy-duty vehicles, Energy Journal 2025
- Using Turbogenerators for Energy Recovery in Turbocharged Hybrid Powertrains, SAE CAPRI 2025
- Investigation of a Lambda Leap Strategy for Hydrogen Internal Combustion Engines to Balance Efficiency, Performance, and Vehicle Packaging, SAE CAPRI 2025
- Joule Cycle-based Waste Heat Recovery from Heavy Duty Truck Engines, ASME Turbo Expo 2024
- SOFC-GT Hybrid Power System for Passenger Aircraft, Poster Presentation, Aerospace Propulsion Energy Systems (APES) Conference, KAUST 2024
- Analysis of HER System to Improve the HEV Performance Range by 5%, GT Conference 2013, Frankfurt, Germany
- Thermal Management Fuel Economy Improvement of HEV Model, JSAE Conference 2012, Tokyo, Japan

## AWARDS/HONORS

- GM Award, Nissan Motor Corporation, 2014, Japan
- Ford Engineer Award, Ford Technical Services India, 2011, India
- GEM of the Month, EASi Engineering Services India, 2011, India

## REFERENCES

- Available upon request