

NAGARJUNA GOUD H R

Overall 10+ years experience with B.E (Mechanical) and M.Tech (Automobile)

E-mail: nagarjuna.deepa.hrg@gmail.com

Mobile: +91 95913 80753 // +91 80958 45318

■ PROFESSIONAL OBJECTIVE

- To become successful Engineer by developing innovative technologies through critical thinking, root cause analysis and technical problem solving, which contribute for welfare of human beings and society
- To involve in research and development activities like improving energy conversion efficiency, reducing harmful gaseous emissions, reducing energy losses...etc which helps to make 'GREEN EARTH'

■ CAREER GOALS

- Currently seeking for full time job opportunity in Engine development by simulation, using 0D, 1D & 3D tools, accompanied with Engine testing, after gaining expertise in 1D Engine simulation during 10+ years of experience
- To involve in simulation led Engine research & development activities, associated with extensive Engine testing

■ PROFILE SUMMARY

- Overall 10+ years of experience in 1D simulation and analysis of Diesel Engines and Gasoline Engines performance simulation vs test validation, Turbocharger matching, Exhaust sound pressure analysis, Engine lubrication system and Engine cooling system analysis using GT-SUITE / GT-POWER
- Worked for USA, Japan, South Korea and Indian OEMs in Automotive, Locomotive and Power generation Engines

■ WORK EXPERIENCE

- **PROJECTS EXECUTED INDEPENDENTLY: from Dec 2021 to Jul 2023 [*Not worked for any company*]**
- **Injector De-activation for Gasoline and Diesel Engines: [Proof of concept by simulation]**
The low load to mid load efficiency improvement, increase in mileage and reduction in emissions of Engine can be obtained by de-activation of only injectors and Engine operates with firing of 1 or 2 or 3 or regular 4 cylinders
- **Diesel Engine with low and fixed Air to Fuel Ratio - 21: [Proof of concept by simulation]**
The Diesel Engine efficiency, mileage can be increased and emissions can be reduced, by operating Diesel Engine with 21 AFR, using throttle valve till mid load and Waste-gated VGT Turbocharger after mid load, no EGR system
- **Vaporized fuel injection into Engine Cylinder: [Proof of concept by simulation]**
The Gasoline and Diesel fuel can be injected into Engine cylinder, by vaporizing fuel and controlling fuel injection pressure, similar to CRDI system. This method improves torque, reduces Engine emissions - Soot, NOx, HC & CO
- **High pressure Air injection into Cylinders: [Proof of concept by simulation]**
The Gasoline and Diesel Engines power, torque can be increased by injecting high pressure air into cylinders, after combustion start, using system similar to CRDI, to improve Engine efficiency, mileage and reduce emissions
- **Engine operation at high efficiency region: [Need help from Testing team and CAE team]**
The Engine is run only at -or- around speed of high efficiency operating region of Torque curve. The vehicle speed is controlled by CVT transmission or automatic transmission with more number of gears
- **Idle load energy recovery and vibration control: [Need help from Testing team and CAE team]**
The Engine crankshaft at idle load (static idling and dynamic braking) is connected to generator to charge battery to recover energy losses, valve in exhaust system to reduce idle load vibrations

○ **Company:** Tata Consultancy Services - EIS, Pune, India
Department: 1D_CAE (Offshore team)

Designation: Assistant Consultant
Duration: May 2017 to February 2021

- Worked for Japanese client - Mitsubishi Motors Corporation (MMC), Okazaki, Japan
- Engine performance simulation for full load, part load, transient operating conditions and validation with respect to test data, including fast running model (FRM) conversion, test data analysis and its sanity check
- Exhaust sound pressure analysis and muffler internals design to meet tailpipe noise and back pressure targets
- Combustion calibration and Turbocharger (Single Stage, VGT, WGT and Two Stage) calibration w.r.t. test data
- New methodology development for Turbocharger maps accuracy improvement, Fuel consumption map creation
- Modelling and simulation of Engine lubrication system, Engine cooling system, Transmission oil cooling system
- Model based PID controllers tuning, EGR and Throttle control system development in GT-POWER
- Engine and Vehicle performance simulation for drive cycles - NEDC and WLTC - Hot and Cold conditions
- Methodology development for Engine simulation and analysis, standard operating procedure (SOP) preparation
- **Major projects executed:**

a) Title: Integrated Vehicle Performance Co-Simulation (MIL) / Team size: 3 Engineers + 1 TL / Duration: 6 months

Description: Integration of validated Diesel Engine (with Variable Geometry Turbocharger) model in GT-POWER, Vehicle model in Velodyn, ECU model in Simulink, Exhaust Aftertreatment model in Axisuite on Velodyn platform and perform Vehicle performance co-simulation (MIL) and validation with respect to drive cycles test data.

My responsibilities: Diesel Engine (with VGT) performance simulation for full load, part load and transient operating conditions [including FRM conversion] and validation with respect to test data. EGR & Throttle control system development based on Oxygen concentration. The method development for integration of GT-POWER, Velodyn, Simulink & Axisuite software tools on Velodyn platform & perform Vehicle performance co-simulation.

b) Title: Turbocharger maps accuracy improvement / Team size: 1 Engineer / Duration: 3 months

Description: The Compressor and Turbine maps provided by Turbocharger suppliers are not highly accurate in most of the cases, due to type of method chosen for maps preparation and inherent problems associated with the type of method chosen. A new method was developed to improve Turbocharger maps accuracy.

My Responsibilities: A new methodology developed for Compressor and Turbine maps accuracy improvement by time efficient manual iterative method, with respect to Engine test data using only GT-POWER tool. This method was validated with improved accuracy of simulation results vs test data for Gasoline Engine (with WGT).

c) Title: Fuel consumption map creation / Team size: 1 Engineer / Duration: 2 months

Description: Fuel consumption map is necessary to evaluate fuel consumption of Engine for various operating conditions, especially drive cycles. The fuel consumption map is created by simulation, which helps to optimize fuel consumption of Engines at lesser cost, time and man power.

My Responsibilities: A methodology developed for fuel consumption map creation for naturally aspirated Gasoline Engine with Intake Variable Valve Timing (VVT). The created fuel consumption map, optimized spark timing and VVT timing by simulation were validated with respect to test data with high accuracy.

d) Title: Exhaust sound pressure analysis / Team size: 1 Engineer / Duration: ~ 1 month for each task

Description: Exhaust sound pressure analysis is to analyse Engine order / combustion noise at Exhaust system tailpipe. The muffler internals are designed and tuned to attenuate Exhaust sound pressure. Design and analysis of Exhaust system and muffler by simulation reduces prototype testing, development cost and time.

My Responsibilities: Exhaust sound pressure analysis of Gasoline Engines and Diesel Engines, Muffler internals design, optimization of tailpipe noise and back pressure to meet customer targets, Muffler internal valve modelling and calibration, comparison and validation of Exhaust sound pressure - simulation vs test.

e) **Study Project: 2 Stage Turbocharger Diesel Engine simulation / Team size: 1 Engineer / Duration: 3 months**

Description: The 2 Stage Turbocharger configuration consisted of high-pressure compressor with bypass, high pressure VGT turbine with bypass, low pressure compressor, low pressure wastegate turbine, high pressure EGR and low pressure EGR. The goal was to select Turbo maps, develop Turbo valve mapping & EGR control strategy.

My Responsibilities: Regulated 2 Stage Turbocharger valve mapping / valve control strategy development, high pressure EGR and low pressure EGR control system development, Engine performance simulation for full load, part load & transient conditions for 4 (can be 5) modes on speed-torque curve, Engine performance simulation.

- **Company:** Faurecia Emissions Control Technologies, Bangalore, India **Designation:** Analyst
Department: Acoustics/NVH **Duration:** December 2012 to March 2015 & July 2015 to April 2017

- Worked for various OEM clients like General Motors, Chrysler, Ford and Volkswagen
- Exhaust sound pressure analysis, muffler internals design to meet tailpipe noise and back pressure targets
- Thermal analysis, back pressure analysis of Exhaust system and correlation with respect to test data
- Weight, cost and volume reductions of Exhaust system and muffler. Exhaust gas flow simulation using 3D CFD
- Worked with cross functional teams: 1D CAE, Product Development, CAD, FEA, 3D CFD
- **Major projects executed:**

a) **Title: Muffler weight / cost / volume reduction for VW Passat / Team size: 1 Engineer / Duration: 1.5 months**

Description: Production exhaust system model consisted of both large front and rear mufflers. The goal was to reduce volume, cost and weight of exhaust system, by implementing various available advanced technologies.

My Responsibilities: The front and rear large mufflers were replaced by single in-pipe passive adaptive valve and a newly tuned muffler 25% larger volume than rear production muffler and by eliminating front muffler, which met tailpipe noise and back pressure targets in simulation. The proposed exhaust system and muffler configuration was tested on Vehicle and tailpipe noise levels, back pressure values met targets set by customer.

b) **Title: Mufflers design for Cadillac - Alpha 2 platform (GM) / Team size: 2 Engineers / Duration: 6 months**

Description: The front and rear mufflers with volume 5 litres (approx.) and 45 litres (approx.) respectively were required to be designed and tuned by simulation, to meet tailpipe noise and back pressure targets in RFQ phase and followed by development phase for Cadillac - Alpha 2 platform (GM) Vehicle launches from 2020 onwards.

My Responsibilities: The mufflers internals were designed and tuned by simulation for 3 Turbo Gasoline Engines: 2.0L-I4, 2.7L-I4 and 3.0L-V6, which found application in Premium, Luxury & Sports Vehicle segments of GM A2XX series, which successfully met targets set by customers, for tailpipe noise levels and back pressure values

- **Company:** General Electric (JFWTC), Bangalore, India **Designation:** Intern (M.Tech project)
Department: GE Transportation **Duration:** May 2011 to April 2012

- **M.Tech thesis:** Turbocharger calibration using PID controllers in GT-POWER
- A new standard method was developed for Single Stage Turbocharger calibration/matching with Engine by using model based PID controllers, which can be performed within a month compared to optimizer or DOE method, which might take several months depending on number of operating points
- A new method developed & validated for calculation of 'Surge Margin %' for Compressor, which is applicable to all types of Compressors of Turbocharger (This method came out exactly same as method mentioned in book 'Turbocharging Internal Combustion Engine' by Watson and Janota)
- The calibrated PID controllers can be utilised for calibration of other types of Turbochargers like Variable Geometry Turbochargers (VGT), Wastegate Turbochargers (WGT) and 2 Stage Turbochargers

- **Company:** Hyundai-Rotem Company, bemi, Bangalore, India **Designation:** Executive
Department: Material Management **Duration:** Jan 2010 to May 2010

- Material Requirement Planning (MRP), Material Management and Control for Metro train coach assembly
- Production control and regular production status check for assembly of Metro train coaches
- Material procurement status and logistics status - check and follow ups, regular meeting with production team

○ **Company:** Kirloskar Oil Engines Limited, Pune, India
Department: Manufacturing / Production

Designation: Graduate Engineer Trainee
Duration: Aug 2008 to Jul 2009

- Production / shop floor: Machining and assembly of Turbocharged Diesel Engines (I3, I4, I6 & V8, V10, V12)
- Machining processes, process planning, tools selection for CNC machining and exposure to CNC programming
- Production and material: management and control, quality check ups, new production line setup for crankcase
- Exposure to Engine testing, manual Engine diagnostics, Engine prototyping and design for manufacture

■ EDUCATION

Degree	Branch	Year	College (from India)	Score
Master of Technology	Automobile Engineering	2010 - 2012	National Institute of Technology, Warangal	8.69 CGPA
Bachelor of Engineering	Mechanical Engineering	2004 - 2008	RYMEC (formerly VEC), Ballari (VTU University, Belgaum)	75.01 %
12 th standard	Science (Phys, Chem, Math, Bio)	2002 - 2004	Government Junior College, Ballari	78.50 %
10 th standard	(Kannada, English, Hindi Maths, Science, Social)	1999 - 2002	S G High School, Ballari	78.40 %

■ SOFTWARE TOOLS - HANDS ON EXPERIENCE

✓ GT-SUITE / GT-POWER	✓ Ricardo WAVE	✓ FloMASTER
✓ Amesim (familiar)	✓ Simulink (familiar)	✓ STAR-CCM+ / Ansys Fluent
✓ HyperMesh	✓ Catia-V5 / Creo	✓ C programming (only basics)

■ PERSONAL DETAILS

- **Full Name:** NAGARJUNA GOUD HALIGERI REDDY
- **Date of Birth:** 20 JUNE 1987
- **Gender / Marital Status:** Male / Single
- **Nationality:** INDIA
- **Passport No.:** L6232413
- **Salary Expectation:** 15 lakhs/annum (-or- as per company standards)
- **Languages Known:** English, Kannada, Hindi, Telugu and Marathi
- **Permanent Address:** Nagarjuna Goud H R, s/o late Veerana Goud H R (Dalapathi), Near Anjaneya temple, K Veerapura, Ballari (taluk and district), PIN-583111, Karnataka state, INDIA
- **Hobbies and Interests:** Reading technical and personality development books, watching movies, listening to music, roaming within cities, observing and learning from nature and creation, sharing creative ideas with family members and colleagues..etc.

DECLARATION

I hereby declare that, above mentioned information is genuine up to my knowledge and I bear the responsibility for genuineness of all above mentioned details

Place: Ballari, Karnataka
Date: 04 September 2023

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