

# CURRICULUM VITAE

## PERSONAL INFORMATION

Huzefa Shabbir Hussain Kagalwala

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## WORK EXPERIENCE

2017–2019

### Calibration Engineer, Power Train Development

Mahindra Research Valley, Chennai

- **Calibration development, of an upcoming 1.2L diesel SUV application to meet BS6 emissions**
  - Contributed in optimizing in-cylinder combustion parameters during rich engine operation to optimize Lean NOx Trap (LNT) exhaust after-treatment system's performance by analyzing engine bench, vehicle chassis dyno and on-road vehicle level test data.
  - Ran tests on engine dyno and on-road to collect NOx emissions data and calibrated the complete model-based NOx emissions module in the Bosch EMS, to predict the engine out NOx emissions, NOx loading, and unloading rate based on catalyst efficiency.
  - Calibrated the temperature and ambient temperature correction maps of the rich mode in vehicle and engine dyno level.
  - Calibrated a supplementary rich combustion mode for added functionality at low exhaust gas temperatures
- **Selection & Performance evaluation of Lean NOx Trap (LNT) technology for a compact diesel SUV application**
  - Working in LNT CoE, to develop calibration understanding and optimization of Lean and Rich engine operation, utilizing Hardware-in-loop, engine dyno and on-road testing
  - Executed a pragmatic evaluation strategy to select optimal Precious Group Metal (PGM) loading in LNT catalyst based on steady state performance, various on-road test cycles, and Light-off characteristics
- **Development of simulation tools to aid process improvement**
  - Created a real-time tool, integrated in INCA, for the Real Driving Emissions (RDE) trip validation based on defined qualifiers like trip share, aggressiveness, etc.
- **Finalization and execution of LNT Ageing Cycle.**
  - Worked with AVL List GmbH, to finalize an LNT ageing cycle which is representative of performance deterioration when exposed to real engine exhaust instead of synthetic gas bench ageing.
  - Successfully implemented the cycle to age catalysts for 2.5L and 1.5L engine platforms.
  - Implemented the cycle by writing automation code in AVL Puma as well as iASYs Programmer
- **BS6 Fleet Data Calibration & Handling**
  - Calibrated a separate combustion strategy to mitigate fuel in oil dilution issue due to rich combustion.
  - Developed a MATLAB tool to analyse the data coming from a fleet of 25 vehicles to assess deviations from expected outcomes and kept a track of changes being made to calibrations on a day-to-day basis.

## EDUCATION AND PROJECTS

2013–2017

### B.E., Mechanical Engineering

Muffakham Jah College of Engineering and Technology, Osmania University, 84.26%

2019 – 2021

### M.S., Automotive Engineering

Clemson University – International Centre for Automotive Research

Grades : 3.91 / 4.0

## ACADEMIC PROJECTS

Class Project  
2019

- **Automatic Cruise Control and Lane Keeping in an RC Car**

- Implemented Automatic Cruise Control and Lane Keeping in an RC car using ultrasonic sensors and Arduino Uno. PID control and sensor fusion using Kalman filtering were the concepts utilized.

Thesis Project  
2016–2017

- **Experimental Validation of Merchant's Principles & Taylor's Tool Life Equation**

- Created a robust experiment to gather relevant data on parameters like feed rate, heat dissipation, tool wear for different combinations of workpiece and tool materials and hereby validate the equations of Tool Design.

2014–2017  
Group Projects

- **Design of All-Terrain Vehicle, Mahindra BAJA SAEINDIA 2015,2016 and 2017**

- Spearheaded the Transmission Design department. Responsible for the design & optimization of the CVT, gear train, gearbox housing, and engine bay using SolidWorks and ANSYS. Designed and fabricated a TORSEN differential for the ATV. Headed the Quality and Costing functions too.
- Represented our university at the national level design and fabrication event of BAJA 2016 wherein we secured 5<sup>th</sup> rank out of 350 teams in the Cost Report and Design Presentation.

2014–2015  
Group Project

- **Design of Motocross bike, STUDENT MOTOCROSS CHAMPIONSHIP 2015**

- Worked as Transmission Designer in Team Stallions MJCET. Responsible for design and optimization of the drivetrain of the motorbike.

2016–2017  
Research Project

- **"Study of the effect of Vacuum Degassing on Quality of Aluminum Alloy Castings"**

- Worked in a team of 3 to design and fabricate the vacuum degassing setup and casting moulds.
- Designed experiments to assess advantage of vacuum degassing over tablet degassing and the effect of alloying materials like boron and sodium.
- Ran tests to find out optimal degassing time and vacuum pressure for the alloy melts.

## PERSONAL SKILLS

Language Skills  
Mother tongue

English, Hindi, Telugu, German (elementary), Arabic (elementary)  
Gujarati

Managerial skills

- Lead team of 25 member and represented our university at the BAJA SAEINDIA competition.
- Served as Treasurer (2014-15) and President (2015-16) of Society of Automotive Engineers (SAE), MJCET Collegiate Club. Creative Manager at Engineer Without Borders (EWB), MJCET Chapter (2014-15)
- Organised industrial visits to large-scale industries like APSRTC, HMT.

Software skills

- SOLIDWORKS 2017, ANSYS 17.0 (Workbench), ETAS INCA, MDA, MATLAB, Simulink, AVL Concerto, AVL Indicom, ROS, TASS PreScan
- Adobe Photoshop, Adobe Premier Pro, Adobe Illustrator
- Python 3.x, C++

Achievements

- Won cash prize worth Rs.5000 for implementing the LNT Ageing Cycle.
- 5<sup>th</sup> overall in my batch of 120 students during my Bachelors
- National champions in STUDENT MOTOCROSS CHAMPIONSHIP 2015 (out of 100 teams)

## EXTRA CURRICULAR ACTIVITIES

Virtual BAJA 2018  
BAJA 2019 - Roppar  
Muffakham Jah College of  
Engineering & Technology

- Part of the Alumni Committee for the virtual round in charge of scoring
- Technical Evaluation Judge for the 2019 edition of BAJA held at IIT-Ropar
- Played in the college football team.
- Organizing member at Adsophos (Technical Fest).