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WORK EXPERIENCE

02/2019 – 05/2020 – Chennai, India
POWERTRAIN AND DATA ACQUISITION ENGINEER – RAFTAR FORMULA RACING (FSAE TEAM)

Activities :
1) Developed a **Raspberry Pi** based **centralised system** to receive, process, store and transmit multitudes of data channels running all throughout the car.
2) Built **Seamless connection** with an interactive touchscreen driver display for **better driving experience**.
3) Key parameters like **vehicle speed**, **engine RPM**, **Gear, Shift indicators**, **Engine Temperature** to be made available to the driver.
4) Made it compatible with protocols like **CAN**, **Mod-bus**, **TCP**, Serial (**UART**) in order to **reduce complexity** in sensor harness and **improve reliability** of data acquired.
5) Established Instant live transmission of data to Data Engineer's system to enable **real-time** analyse
Responsibilities :
1) Design Validation : comparing parameters obtained during simulations and optimisations with real, live data obtained from the car's DAQ systems.
2) Tuning the Car : Tuning important parameters of the vehicle's dynamics and powertrain using data obtained from the sensors.
3) Driver Trining : Guide the driver using data obtained from testing to get the best possible performance out of the car

15/01/2019 – 05/05/2019 – Chennai, India
PROJECT MEMBER - ETHANOL GASOLINE DUAL INJECTION – PROF. A RAMESH - DEPARTMENT OF MECHANICAL ENGINEERING, IIT MADRAS

1) Devised a circuit to lengthen **TDC** signal to 0.5ms to **avoid drifting** of fuel injection signal.
2) Calibrated both injectors using gasoline and converted appropriately for **ethanol**.
3) Assisted in developing control program to operate the ethanol-gasoline **dual injection system**, incorporated it in an **ECU** and ran in 4-stroke **200cc SI** engine with varying ethanol to gasoline **ratio** based on operating requirements.
4) Used **mapped volumetric efficiency** of engine as a function of **speed** and **throttle position** to determine **air flow** mass rate.
5) Estimated quantities of both fuels based on **equivalence ratio** and **ethanol to gasoline ratio** and adjusting **injectio n durations** accordingly.
6) Spark timing is also mapped and used accordingly.
7) Experimentally observed effect of **ethanol** at different concentrations on Brake Power, Brake Thermal Efficiency and so on to estimate best efficiency range.

18/05/2018 – 19/04/2019 – Chennai, India
VEHICLE COMMUNICATION ENGINEER – NIKOTTO - A STARTUP INCUBATED BY IIT MADRAS

1) Incorporated YOLO algorithm for pedestrian and **lane detection** to determine **offset** of vehicles from road's centre.
2) Determined distance and vehicle relative motion with **RADAR**
3) Designed a system to suggest **gear** and **throttle** input to driver from data acquired from 6-axis **IMU** sensor
4) Designed a system to preset destination based on traffic details acquired from GPS and IOT based **google API.**
5) Used **BLDC motor** to operate windshield based on moisture content in front glass.
https://drive.google.com/file/d/1k2HW6HjwYKcPptR_2C5c55_x1yYTHPp1/view?usp=sharing

03/2021 – 08/2021 – Chennai, India
BACHELOR THESIS - DESIGN OF AN AUTOPILOT FOR PATH FOLLOWING – PROF. SURESH RAJENDRAN, DEPARTMENT OF OCEAN ENGINEERING, IIT MADRAS

1) Solved a highly nonlinear system for container ships with numerical Runge Kutta method and generated open loop trajectory
2) Modelled the corresponding linearised time invariant system in s-domain inorder to tune various controllers like PID, LQR and Linear MPC.
3) With resulting closed loop system, the the output (yaw angle) and aggressiveness action on the input (rudder angle) were compared and analysed.
4) Implementing the path following algorithm to follow given trajectory by controlling vessel's heading angle. Line of Sight Algorithm is used to achieve the same.
5) Simulated in presence of developed models of environmental disturbances (like wave, wind) to show how MPC performs superior than the others.

https://drive.google.com/file/d/1jvM-bO0sexTxpb_Jr8gJLQeD5m1wlFiw/view?usp=sharing

05/2018 – 08/2018 – Chennai, India
INTERNSHIP - APPLICATION DEVELOPER – PLANYS TECHNOLOGIES

1) Developed an algorithm to generate and store a systematic report after each operation of submersible ROVs that **reduced** time constraints for operations team and enabled proper documentation with **less efforts**.
2) Developed an Android app to provide weather **forecast** to decide the operating time and suggested ROV **deploying location** for supervising underwater structures.
https://drive.google.com/file/d/1WcO2lLNsAWjMcuDtVTgT4SX67iiYfdGR/view?usp=sharing

EDUCATION AND TRAINING

25/07/2017 – CURRENT – Chennai, India
B.TECH IN NAVAL ARCHITECTURE AND OCEAN ENGINEERING – Indian Institute of Technology Madras

https://www.iitm.ac.in/

LANGUAGE SKILLS

Mother tongue(s): TAMIL

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C2	C2	C2	C2	C2
GERMAN	B1	B1	B1	B1	B1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Analysis and Simulation

MATLABSimulink | Ansys Aqwa | labVIEW

Programming Languages

C C++ Language | Python | Java | XML & JSON

Modelling Softwares

High ability to use AutoCAD | Autodesk EaglePCB | Autodesk Fusion360

Hardware

Engine Control Unit (ECU) | Microcontroller Arduino Raspberry Pi

HONOURS AND AWARDS

21/09/2019
Winner of Hackathon – Think42 Labs Pvt. Ltd.

1) Devised an **algorithm** in **Java** Prog. Language to find a sequence to visit given places in shortest period to save fuel and tourists and delivery services.
2) Incorporated Google Maps **REST API** to fetch **real-time traffic data** to input above algorithm and to suggest the more preferred path along the generated sequence.
3) Developed android app as a user interface.
4) Connected **multiple users** using firebase to suggest most used locations and improve user experience.
https://www.hackathon.com/event/thinkathon-5d762d6c73415e0021ffe602 https://drive.google.com/file/d/1_BErigoZ-3o1xjczRaItY4LRMHRzLGpa/view?usp=sharing

25/01/2020
Overall Champions in Combustion Vehicle Category - Raftar Formula Racing – Formula Bharat 2020

1) A National level **formula student** event. Competed with **58** other formula student teams all over India.
2) Presented and Finished **1st** in Static Design Event. Also finished **1st** in Business Plan Presentation and Fuel Efficiency with **7.5L/100** km.
https://www.formulabharat.com/wp-content/uploads/2020/02/Results_CV_Overall_FormulaBharat2020-2.pdf https://drive.google.com/file/d/181N4jwlP4mpxDbqcf60gKG8Ygj0GE3W8/view?usp=sharing

20/03/2020
Runner of Bajaj Mach Challenge 2020 – Bajaj Auto

1) Constructed a system consisting of an Android app as a dashboard that collects data from mobile sensors and vehicle's powertrain for objective assessment of **Ride**, **Handling** and **Performance**.
2) Acquired engine data through **OBD II protocol** and transferred it to raspberry pi via bluetooth, then via Wifi-Direct to transfer it to mobile.
3) Used **Extended Kalman filter** techniques for IMU **denoising**, then finally logged to firebase.
https://www.bajajauto.com/careers/mach/roadmap https://www.linkedin.com/posts/bajaj-auto-ltd_bajajauto-theworldsfavouriteindian-activity-6648043676650049537-LKKe