

## □ EDUCATION

- **The University of North Carolina at Charlotte** – Charlotte, NC May 2022  
Master of Science: **Mechanical Engineering (GPA: 3.5/4.0)**
- **Gujarat Technological University** – Ahmedabad, India June 2016  
Bachelor of Engineering: **Mechanical Engineering**

## □ SOFTWARE

- **National Instruments:** **Certified LabVIEW 2019 Associate Developer (NI-CLAD)** (SN # 100-318-11705)
- Autodesk Certification: AutoCAD 2D & 3D (SN# 1LDVXCXRECK1)
- Microsoft Office: Word, PowerPoint, Excel, Outlook & Publisher
- Design & Manufacturing: Eagle Circuit & PCB Design, SolidWorks
- Programming: MATLAB, Python 3, C, C++ & Embedded C
- Other Software: Adobe Creative Design Suite, Base Linux Programming, Web Development
- **In Progress:** PLC Programming, Autodesk Fusion 360, Creo Parametric

## □ WORK EXPERIENCE

### **Integral Analytics LLC – Charlotte, NC** July 2019 – Aug 2019

#### Mechanical Engineering Research Assistant

- Worked with Machine Learning and Regression Tools including MATLAB & Python 3 to develop predictive analytical models for a Monitoring & Diagnostics (M&D) Program applied to a gas power plant operation

### **TE Connectivity (via Aerotek Staffing) – Greensboro, NC** May 2018 – Dec 2018

#### Automation Engineering Intern

- Extensively used NI *LabVIEW Programming Environment* to create **FPGA-Based** Real Time Process Analysis & Control Systems with dynamic Human Machine Interfaces (HMIs)
- Integrated an array of **electrical sensor systems** and **actuation systems** alongside tailored program and logic to achieve required control algorithm patterns
- Also worked on **cost-benefit analysis** to analyze present production line, locate active delay & product loss sources, and proposals to upgrade them from multi-year data, with proposed financial savings upwards of \$50,000

### **Rowe Arts Digital Fabrication Lab (RoFL) – UNC Charlotte** Jan 2017 – July 2018

#### RoFL Support – Lab Technician

- Primary task was Administration and Maintenance of Several **Rapid Prototyping Tools:** 3D Printers, Laser Cutters & CNCs, alongside training of students and faculty on usage of that equipment and conducting workshops pertaining to Digital Fabrication & Arts. Also designed & fabricated several wooden equipment for use in lab using several **wood-working tools**

### **William States Lee College of Engineering – UNC Charlotte** Aug 2017 – Dec 2017

#### Graduate Teaching Assistant – Instrumentation Lab

- Taught **Instrumentation fundamentals** to undergraduate students on a multitude of sensors, signal processing, actuator control, PID systems & data acquisition with extensive use of LabVIEW, MS Excel & MultiSIM
- Conducted lab workshop sessions training students to use accelerometers, encoders, DAQ systems, alongside core instrumentation devices like oscilloscopes & signal generators. Grading submissions as auxiliary tasks

### **Ashish Enterprises – Ahmedabad, India** July 2015 – Dec 2015

#### CAD Design Intern

- Worked as part-time intern as CAD designer, with primary work in drafting & modification of industrial manufacturing drawings in AutoCAD, secondarily also developed layouts for laser cutting of sheet metal to required designs

### **L J Centre of Excellence – Ahmedabad, India** July 2013 – May 2015

#### Student Coordinator

- Initiated and organized several technical workshops as student coordinator of LJ COE, including Winter School 2014, Engineer's Day 2013 & 2014, Techventure 2014 & more, leading team of 9 students during one of the events

### **BAJA SAEINDIA 2015 – Ahmedabad, India** July 2014 – April 2015

#### Student Lead

- Participated of Team Blackhawks of LJET in **BAJA SAEINDIA 2015**, in designing and construction of an All-Terrain Vehicle (ATV)
- Handled the **electrical division**, including design and assembly of lighting systems, emergency kill switches, instrument panel, of the ATV & as a part of **manufacturing division**, assisted in fabrication of roll cage, paddle levers & mounting of engine & corresponding configuration

Gujarat State Electricity Corporation Limited – Gandhinagar, India

Jan 2015 – Feb 2015

Engineering Trainee

- Worked as trainee engineer, in **energy production and distribution**, assisting in various power plant functions including but not limited to Power Distribution Control, Turbine Steam & Water Management, Fuel Movement & Ash Management

Honda Cars India Ltd. – Ahmedabad, India

Feb 2014

Engineering Trainee

- Worked as trainee engineer in **Automobile Maintenance and Reworks** department, assisting in maintenance of primarily automobile engines and secondarily in brakes, suspensions & wheel balancing departments

#### □ ACCOMPLISHMENTS

**Mecanum-Drive Robotic System with Machine Vision and Sensor Fusion**

Jul 2019 – Dec 2019

- Assisted departmental colleague in his thesis project in areas pertaining but not limited to extended LabVIEW programming to consolidate different hardware components in a streamlined state-machine based software program primarily in LabVIEW and parts in C/C++
- Reverse-engineered RP-LIDAR A3M1 module communication protocol using bit-banging methods over serial communication and a decompression algorithm to extract data received in 132-byte binary raw packets into understandable & processable information, with a sustainably high refresh rate of data without considerable loss and corruption of data, to be converted to an independent project

**Design & Development of Dynamic Ultraprecision 3- Axis Accelerometer using OKES**

Aug 2017 – April 2018

- Research & design of a 3-Axis Accelerometer setup using multi-axis flexure stage and optical knife-edge sensors (OKES) with the objective of achieved fast dynamic response along with very high precision
- Primary design proposal had Raspberry Pi & Arduino - LabVIEW based communication system

**Dynamic Electromagnetically Actuated Flexure Stage for Micro-Displacement Control**

Jan 2017 – May 2017

- Co-designed mechanism and developed LabVIEW based control system for displacement control of a flexure stage using dual solenoid actuators and multiple OKES to obtain displacement in resolution of **500 nanometers**
- Designed & prototyped **Differential Knife-Edge sensors** with active noise cancellation & error correction
- Designed and manufactured circuits to interface between mechanism & National Instruments myRIO microcontroller for control of the flexure stage, using **Eagle & PCB CNC Milling** and surface soldering methods

**Autonomous Self Navigating DaNI Robot**

Jan 2017 – May 2017

- Designed closed loop control system using **PID logic** with **encoders on stepper motors** & ultrasonic distance sensors on NI myRIO, to move robot on an obstacle path, without external inputs, avoiding collisions on way
- Sequential & Concurrent control logic developed & programmed in NI LabVIEW for motion control

**Prototype of Wireless Motion Capturing Digital Knee Sleeve**

Aug 2017 – Dec 2017

- Co-designed a knee joint **motion detection sleeve**, to detect knee rotation as well as flexion & extension
- Designed and fabricated wearable **Arduino & Embedded C** based circuit with array of sensors to detect motion
- Developed a data acquisition and analysis program for data processing and evaluation

**Implementation of Automated Manual Transmission (AMT) In Two Wheelers**

Dec 2015 – June 2016

- Designed and developed an **innovative automatic gear shifting mechanism** in a manual transmission-based two-wheeler as senior design project, with aim of increasing fuel efficiency and rideability, as a proof-of-concept
- Developed and programmed algorithms on Arduino microcontroller for the control system, taking factors such as current vehicle & **engine speed**, current **throttle & clutch** position, and current **drive mode** in calculation
- Co-developed mechanism for **electromechanical cable shifting actuator** using stepper motors and gears

**Prototype of Portable Conveyor Belt Based Load Lifting Mechanism**

July 2015 – Dec 2015

- Co-designed a flexible & portable **motorized conveyor belt** system as senior design project
- Modelled the system and computed the simulation and load analysis of the system

#### □ AREAS OF INTEREST

- Industry 4.0**
- Manufacturing Automation**
- Internet of Things (IoT)**
- Artificial Intelligence (AI) in Production Machines**
- Decentralized Sensor Data Acquisition Systems**
- Electric Vehicles & Quick-Charge Solutions**
- Mechatronics & Instrumentation
- Digital Fabrication & Rapid Prototyping
- 3D & Resin Printing and Laser Cutting
- Micro & Nano Electro-Mechanical Systems (MEMS & NEMS)
- Biomedical Robots & Wearable Technology

*Work References will be furnished upon request*