



Zenin Easa Panthakkalakath

Software Developer | Mechanical Engineer

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Professional Summary

I am a strongly motivated, and passionate engineer who likes to explore new possibilities, learn new things, and develop new skills. I have experience in developing products and systems that involve full-stack software development and hardware design and implementation. I love to work on projects and teams involving interdisciplinary skillset.

Skills

General purpose programming languages: **C++**, **JavaScript**, **MATLAB**.

Single board systems: **Arduino**, **Raspberry Pi**.

Model based design: **Simulink**.

Hardware design and manufacturing: **AutoCAD**, **CNC**.

Work Experience

MathWorks India Pvt. Ltd.

Associate Engineer | System Architecture Verticals | Control Design and Automation July 2019 - present

I am part of a team that builds tools for Discrete Event Simulation and Agent-Based Modeling. My work includes both frontend and backend (engine) development in JavaScript and C++, and the usage of MATLAB/Simulink to demonstrate the different potential integrated workflows with existing products.

Associate Engineer | Engineering Development Group June 2018 - July 2019

This group facilitates novice recruits to learn about MathWorks products, help the customers with the products, and find a target team or product to work on. During the period, I implemented the Deep Learning Toolbox Model for Xception Network support package before moving onto work with my current team.

Vuelogix Technologies

Summer Internship May 2017 - July 2017

Learned about deep neural networks just enough to implement a system that detects if people are wearing helmets inside ATMs using security footage using transfer learning on YOLO V2. I also worked on a React Native App that assists field agents set up security devices in ATMs and management to monitor the work.

Forthcode Technologies

Summer Internship May 2016 - June 2016

Implemented an adaptive search program that is capable of retrieving the best results based on phonetic similarity and user choice history for the query.

Education

Indian Institute of Technology Patna

Bachelor of Technology, Mechanical Engineering July 2014 - May 2018

In addition to courses in Mechanical Engineering, I attended courses including Introduction to Deep Learning, Fundamentals of Cognitive Science, and Geometric & Topological Modelling, and cleared a total of 367 credits.

Patents

System and method for detecting the change in occupancy status of slots over a platform

Pending | IN201731036379 | Indian Institute of Technology Patna December 2017

Assuming that there is a platform that is dividing into many slots, we can detect occupied slots and what the weight of the objects on these slots are using just three weight sensors placed at known non-collinear points. We used this idea to solve two very different problem statements.

1. Vehicle slot identification in a single entry parking system that lets you know about the free slots. We created and demonstrated a miniature working prototype and got selected for pre-incubation at BoschDNA.
2. Smart kitchen containers that can calculate average nutritional intake, suggest recipes, and notify when one runs out of food. We were finalists in Smart Embedded Applications & IoT Grand Challenge conducted at ISED 2016 and Intel Rapid Prototyping Camp 2017.

Cryogenic Micromachining Apparatus and Method Thereof

Pending | IN202031020431 | Indian Institute of Technology Patna May 2020

A closed machining chamber featuring the ability to control the temperature of the workpiece and the ability to set real-time initial tool-workpiece reference coordinates to maintain temperature uniformity below a glass transition temperature of the workpiece and dimensional accuracy. My contribution, described in my bachelor

thesis, was to create a robust method that would allow setting up the reference coordinate by tool-workpiece contact detection for non-conductive workpieces.

Publication

A Framework for COVID-19 Medicine and Vaccine Distribution Modeling, Analysis and Decision Making

Under review | Journal of Simulation

November 2020

An Agent-Based Modeling framework for modeling disease spread with the capability to generate people as agents with various attributes such as mobility, infected, immune, etc. and an environment having boundaries that the agents may or may not cross according to probability specified during modeling. The conditions to implement a lockdown and mobility during a lockdown, as well as parameters related to when vaccine and medicine distribution begins, the quantity and frequency of replenishment, are editable. We modeled and simulated disease spread for a hexagonally divided hierarchical settlement inspired by Central Place Theory subjected various choices for the parameters mentioned in the previous sentence.

Other Projects

Tool-Workpiece Contact Switch for Micromilling Machine

Bachelor Thesis | Indian Institute of Technology Patna

July 2017 - May 2018

Finding the contact point between the tool and the workpiece for a non-conductive tool-workpiece combination and setting it as the vertical axis reference point. The micromilling machine that existed in our lab has a contact probe that works for conductive materials; the principle being that the tool is connected to one terminal and workpiece to the other, and when they touch, the circuit gets completed. To make this work for a non-conductive tool or workpiece, I hacked the machine using a secondary circuit that utilizes a few piezoelectric sensors that trigger the aforementioned circuit completion based on incoming pressure variation. This helped our institute cut costs by avoiding the purchase of new equipment.

Driver Suggestion System

Enduro Student India | Indian Institute of Technology Patna

December 2016 - January 2017

Fixing a few sensors to an all-terrain vehicle and use machine learning algorithms to provide suggestions to the driver and the crew in real-time. The sensors include a gyroscope, an accelerometer, a temperature sensor, a GPS sensor, and an array of ultrasonic sensors. The signals are processed and the outputs are displayed on a phone fixed near the driver. The output includes vehicle speed, position, ground clearance, and engine temperature.

Alacrity

Human Powered Vehicle Challenge 2016 | Indian Institute of Technology Patna

May 2015 - March 2016

My role was to design and manufacture an aerodynamic fairing for the semi-recumbent bicycle. We participated in HPVC 2016 conducted by ASME and secured 4th in the Innovation Challenge and 5th in the Design Presentation.

Awards and Participation

Runners up in MathWorks BGL Hackday - Twice in three years

November 2018, December 2020

The competition was aimed at creating miscellaneous products involving MATLAB and Simulink. In 2018, we created a product named MAT'CHA, a chatting platform in which the users can run MATLAB commands and display the output. It was intended to make collaboration easier. In 2020, we created a product named OCR assistant, a bot that can read the contents of different windows on the screen (or minimized) and rings an alarm you when certain text appears in the same. This helps in workflows involving waiting for long running processes or commands.

First place in Capture The Flag - Two years in a row

January 2016, January 2017

An online cyber security competition conducted during Anwesha, the annual techno-cultural fest of IIT Patna.

Finalist in Amazon Code Wizard Challenge

April 2017

The competition was aimed at providing an opportunity for students to experience first-hand, the complexity of problems that Amazon deals in its day-to-day operations. Ten teams were shortlisted for the finals.

Volunteering

Coordinator, Web and App Development

Anwesha '17 | Indian Institute of Technology Patna

April 2016 - January 2017

Responsible for managing the website and application development team and hence a part of the Core Committee of the annual techno-cultural fest.

Sub-coordinator, Creatives and Design

Anwesha '17 | Indian Institute of Technology Patna

April 2015 - January 2016

Responsible for managing the website, application development and promotional poster designing team and hence a part of the Organizing Committee of the annual techno-cultural fest.