



## BRIEF OVERVIEW / CAREER OBJECTIVE / SUMMARY

Passionate about Microelectronics and VLSI domains because I feel that in these fields, I can give my best.  
Interested in learning upcoming Technologies and Space Related Stuff.  
Microprocessor and Microcontrollers | Embedded systems and Design | Embedded C | RTOS | MATLAB | VHDL | Xilinx Vivado | Adobe Premier Pro

## KEY EXPERTISE / SKILLS

Xilinx VHDL Proteus NI Multisim Intel 8085 Microprocessor Working and Architecture Intel 8051 Microcontroller Simulation  
Digital Communication IAR Embedded C Embedded Systems TIVA Board TM4C123GH6PM MEMS RTOS Arduino  
MATLAB Adobe Premiere Pro

## EDUCATION

### LNMIIT Institute of Information Technology

2019 - 2023

B.Tech. - ECE | CGPA: 7.54 / 10.00

### Kendriya Vidyalaya No.1 Kota, Kota

2018

12<sup>th</sup> | CBSE | Percentage: 90.60 / 100.00

### Kendriya Vidyalaya No.1 Kota, Kota

2016

10<sup>th</sup> | CBSE | Percentage: 95.00 / 100.00

## PROJECTS

### FPGA Implementation of Back Propagation Neural Network for estimation of harmonics in standing wave (Under Dr. Vinay Kumar Tiwari)

16 Jan, 2022 - 15 Dec, 2022

**Mentor:** Dr. Vinay Kumar Tiwari | **Team Size:** 2

**Key Skills:** MATLAB Neural Networks VHDL FPGA Xilinx System Generator

In this Project we first worked on the software prototype that is, we tried to find the different ways through which we can detect the Odd Harmonics in the wave, after finding the suitable method we worked on MATLAB and then trained it using MATLAB's Neural Network to produce the desired results. With these results we will try to train the Hardware part (FPGA board) so that it can learn to detect the Odd Harmonic components present in the wave.

The aim of the project is to create a hardware model which detects the Fundamental Harmonics from the random waves generated in nature in the form of frequency, amplitude or phase etc using Neural Network.

Link of the Project:

<https://github.com/Barnabh/Detection-of-Odd-Harmonics-in-Standing-Wave-using-Neural-Network>

### Toll Booth System with smart barricades having a counter on it, based on Soft Real-Time Systems (RTOS Project)

01 Oct, 2022 - 08 Dec, 2022

**Mentor:** Dr. M.V Deepak Nair | **Team Size:** 1

**Key Skills:** RTOS Embedded C Embedded Systems Keil Arduino Multiprocessing Multitasking Multithreading

This project is about how:

"I created a Toll Booth system for one vehicle only which closes its the barricade on vehicle detection and on exiting from parking lot it counts the total number of vehicles parked there one at a time. These all things are implemented using the FreeRTOS Library", in short, we used an IR (Infra-Red) Proximity Sensor for sensing the vehicle then operate the barricade using Servo Motor and at last after opening the barricade, we used a PIR (Passive Infra-Red) Sensor to count the number of vehicles parked at that particular spot.

Link of the Project:

<https://github.com/Barnabh/Toll-Booth-System-with-smart-barricades>

### Making of a Practical Lux Meter (Light Intensity Meter) using TM4C123GH6PM 32-bit Microcontroller using IAR Workbench and Embedded C Coding on IAR platform.

05 Mar, 2022 - 05 May, 2022

**Mentor:** Dr. Deepak Nair | **Team Size:** 2

**Key Skills:**

IAR Embedded C Embedded Systems TIVA Board About TM4C123GH6PM Basics about LDR Breadboard ADC  
Potentiometer

In this report we will talk about measuring the light intensity using Light Dependent Resistor (LDR) or Photoresistor and TM4C123GH6PM which is a 32-bit Arm Cortex-M4F based microcontroller. We will first start with the observations by defining the relation between light intensity and resistance so that we can study the graph by manually plotting it, after noting the observations we will try to calculate the constants which we will obtain from our graph and also check its accuracy with the help of datasheet of LDR then we will make a potential divider circuit and take the analog reading of the voltage from it using TM4C123GH6PM and then we will manipulate that voltage to find the resistance of the LDR and ultimately doing calculations we

will find the experimental value of Light Intensity for a given LDR, which is the aim of our project.

Link of the Project:  
<https://github.com/Barnabh/Making-Lux-Meter-using-TM4C123GH6PM>

### Try to study a very rough "Low-Field Magnetic Sensor with a Variable Capacitor" with the basic understanding of GMR Technology.

02 Feb, 2022 - 01 May, 2022

**Mentor:** Dr. Gaurav Chatterjee | **Team Size:** 1

**Key Skills:** GMR Technology MEMS Magnetics PVD and CVD Techniques Magnetoresistance Theorem

In this project we try to study a very rough amateur Low-Field Magnetic Sensor with the help of GMR Technology, we study how the Giant Magnetoresistance (GMR) works and then to get an inspiration to use it in the modern world as a sensor.  
At last, to get the basic idea that with the MEMS we can make a very subtle Magnetic Sensor using GMR Technology by understanding it's concept.

### Stochastic Geometry modelling and Analysis for Intelligent Reflecting Surface Application (Under Mr. Purnendu Karmakar and Dr. Praful Mankar)

01 Aug, 2021 - 15 Oct, 2021

**Mentor:** Mr. Purnendu Karmakar and Dr. Praful Mankar | **Team Size:** 2

**Key Skills:** Integral Calculus Wireless Communications Some knowledge about Reconfigurable Intelligent Surfaces

This Topic is about Stochastic Geometry modelling and Analysis for Intelligent Reflecting Surface Application which requires knowledge of Integral Calculus, Stochastic Geometry, fundamentals of the capacity limits of MIMO systems, Rate Analysis for Millimetre - Wave Cellular Networks etc. Here we will discuss that how can we reduce the number of towers keeping 5G network speed constant in a particular area for which we will use RIS (Reflecting Intelligent Surface) on buildings and then by using Stochastic Geometrical approach we try to find the best possible combination in it. This project comes under the "mini project" although it was not completed but the knowledge and skills, I gained found to be useful, that's why I mentioned it.

### Most Basic Function Generator Using Arduino Uno having single output.

15 Oct, 2020 - 30 Dec, 2020

**Mentor:** Dr. Bharat Verma | **Team Size:** 1

**Key Skills:** Proteus LaTeX Circuit Design Arduino UNO Programming Arduino IDE Compiler Coding

In this project we will make Function Generator using Arduino Uno. Arduino Uno is a microcontroller board based on the ATmega328P, for writing the code we will use Arduino Uno IDE compiler and for running it we use PROTEUS which is a simulation tool.  
This project includes development of a function generator using Arduino Uno, 8-bit DAC, Varying Frequency Circuit, Button Switch Circuit and a 16x2 LCD to generate waveforms of different frequencies and also involves a decent knowledge about Astable Multivibrator, Integrator and LM324 IC.

Link of the Project:  
<https://github.com/Barnabh/Function-Generator-Using-Arduino-Uno>

### Most Basic Function Generator Using PROTEUS having single output.

01 Aug, 2020 - 15 Oct, 2020

**Mentor:** Dr. Sandeep Saini | **Team Size:** 1

**Key Skills:** Proteus LaTeX Circuit Design

In this project we will design a Function Generator with a single output on PROTEUS, that is, it can give you one waveform at a time. The Function Generator which we are designing in this project after completion will be able to produce 4 fundamental wave-forms which are Square Wave, Triangular Wave, Sinusoidal Wave and Sawtooth Wave.  
It also involves a decent knowledge about Astable Multivibrator, Integrator and LM324 IC too.

Link of the Project:  
<https://github.com/Barnabh/Function-Generator-Using-PROTEUS>

## PUBLICATIONS / RESEARCH / WHITE PAPERS

### Involuntary Table Tennis recognition using recurrent neural network on the perception-based data.

22 Jan, 2023

International Journal of Scientific Research in Engineering and Management (IJSREM) | **Mentor:** Dr. Abhishek Sharma |

**No. of Authors:** 4

**Key Skills:** Neural Networks Video Editing Fundamental Programming Language

The goal of this research is to create an automated system for Table Tennis Shots and other Table Tennis activities utilising a pre-trained Recurrent Neural Network (RNN) method using widely available broadcasted movies. In this project, RNN was created from aired video of a Table Tennis practice match to automatically recognise shots and other types of motions.

Link of the Research Paper:  
<https://ijsrem.com/download/involuntary-table-tennis-recognition-using-recurrent-neural-network-on-the-perception-based-data/>

## CO-CURRICULAR ACTIVITIES

- Mathematics Tutor at Gauth Expert, Link: <https://github.com/Barnabh/Gauth-Expert-Offer-Letter>

## EXTRA CURRICULAR ACTIVITIES

- Youtube Channel
- LNMIIT Football League Participant
- Actor and Background Sound Designer in Short Film with a Team

## PERSONAL INTERESTS / HOBBIES

- Pianist
- Playing Guitar

- Footballer
- Astronomy
- Competitive Gaming

## WEB LINKS

- LinkedIn - [https://in.linkedin.com/in/barnabh-goswami-b270b41a6?trk=public\\_profile\\_browsemap](https://in.linkedin.com/in/barnabh-goswami-b270b41a6?trk=public_profile_browsemap)
- Github - <https://github.com/Barnabh>

## PERSONAL DETAILS

**Gender:** Male

**Marital Status:** Single

**Current Address:** D - 28, Gyan Sarovar Colony, Bundi Road, Behind St. John's School, Kota, Rajasthan, India - 324008

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**Date of Birth:** 17 Jan, 2001

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