

Monish Kapadia

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TECHNICAL SKILLS

Programming Languages:	C++, C, Python, JavaScript, Bash Script
Design and Simulation Software:	MATLAB, Atmel Studio, ARM mbed, NI Multisim, Xilinx ISE, PlatformIO, PowerBi, Azure IoT Hub, Visual Studio, Oscilloscope, JTAG
Microprocessors and Microcontrollers:	ESP8266 Feather Huzzah, Teensy 3.2, SAMD21 Xplained Pro, Atmega 328p, Arduino Uno, Raspberry Pi 4
Communication Protocols:	UART, I2C, SPI, CAN-bus, Wi-Fi, Bluetooth, TCP/IP, UDP, ADC/DAC, PWM, GPIO
Web Technologies and Frameworks:	HTML5, CSS3, Bootstrap4, JavaScript, Node.js, REST API, React.js
Database:	MySQL, MongoDB, NoSQL
Version Control:	Git, GitHub, GitLab
Operating Systems:	Ubuntu, Red Hat Linux, Windows, MacOS, FreeRTOS, CLI

WORK EXPERIENCE

Solutions Engineer – RST Solutions Inc., Chalfont, PA

August 2020 – Present

Remote Temperature and Monitoring IoT System

Project Description:

The scope of this project is to design, develop and implement end-to-end solution for remotely monitoring refrigeration system by using **Internet of Things (IoT)** devices and provide real time system alerts.

Technology used: Raspberry Pi 4, jQuery, MERN stack, Python, PowerBI Pro, JD Edwards, Microsoft Azure

Responsibilities:

- Engineered an end-to-end IoT automation product that can monitor variety of devices and send data across different platforms.
- Programmed the embedded software on Raspberry Pi using Python programming language
- Integrated a variety of cloud applications like JD Edwards, Microsoft Azure and custom-built web application for transmitting data collected by IoT devices
- Established a two-way communication between the IoT device and cloud platforms to send as well as receive data
- Implemented the ability to maintain the device remotely with the help of the cloud platforms
- Conceptualized and designed a web application using MERN stack to monitor, maintain and receive notifications for alerts
- Added features to change the metrics, define alert ranges and alter the time interval at which the data is being sent
- Formulated an algorithm to cache the data when there is unstable internet connection and send all the data once the connection is re-established
- Implemented OTA update feature to update the device software remotely
- Designed a real-time dashboard on PowerBI with the sensor data retrieved from Azure IoT Hub

Instructor – NYU K12 Centre for Education, New York, NY

July 2020 – August 2020, June 2019- July 2019

Technology used: ESP8266 Huzzah Feather, Arduino C

- Mentored a batch of 30 high school students in developing software in the field of Internet of Things.
- Designed the curriculum for the program, including innovative project ideas and essential fundamental topics that keep students involved throughout the program.
- Delivered lectures with real life examples to ensure an interactive learning experience.

Android App Developer Intern - UE LifeSciences Inc., Philadelphia, PA

January 2020 – May 2020

Technology used: Java, Android SDK, Firebase, xml

- Conceptualized, developed, tested the Android application, including UI and application functionality that detects breast cancer in early stages by scanning breast tissues.
- Received the data from the hardware module on the Android application using Bluetooth and processed it to have a visual representation of breast tissues.
- Integrated firebase to store user data on cloud.

Technology used: C++, Python, Bash Script, matplotlib

- Improved efficiency of a Systolic Array based Convolutional Neural Network Accelerator.
- Automated the process of running the Systolic Array Simulator using Bash script.
- Added the functionality of showing a temperature graph of the Systolic Array during the run.

SELECTED PROJECTS

Inertial Sensors Based Gesture Recognition

Technology used: Atmega 128, MPU-6050, I2C, MATLAB, HC-06(Bluetooth Module)

- Obtained raw data of linear and rotational acceleration using the 6-DOF accelerometer and gyroscope sensor (MPU-6050) and was then transferred to Atmega 128 using I2C protocol.
- Transferred the raw data of the sensors to the PC with the help of the Bluetooth Module (HC-06) and was later processed using a complementary filter for obtaining stable values.
- Designed a gesture recognition algorithm based on distance and slope measurements to recognize the hand-made gesture on MATLAB in real time.

Autonomous Surveillance Bot

Technology used: Python, Raspberry Pi 3, Raspberry Pi Camera Module

- Designed an autonomous surveillance bot using Raspberry Pi 3, a credit-card sized board computer, that could move around in an unknown environment autonomously and detect faces in a no man's land where human intervention is prohibited.
- Interfaced a motor driver IC L293D to suffice the current requirement of the motors.
- Integrated a camera for face detection and the algorithm was programmed using python on Raspberry Pi 3 board.
- Tracked the location of the bot using GPS module and was continuously monitored on the host.

Cache Simulator

Technology used: C++

- Implemented a two-level (L1 and L2) write-through, no allocate cache simulator in C++ with practical LRU implementation.

HiddenWonderz

Technology used: HTML5, CSS3, SemanticUI, JavaScript, jQuery, Node.js, Passport.js, REST API, MongoDB

- Developed a travel blog website based on RESTful API where users can post their travel experience.
- Deployed the project on Heroku server.
- Implemented user sign up/login to post their travel details using Passport.js.
- Integrated MongoDB database to store user and blog data.
- Designed the website UI with user friendly styling and mobile compatibility using SemanticUI.

PUBLICATIONS

Inertial Sensors Based Gesture Recognition

IJAEET (IRD INDIA): Vol 5 - Issue 2

- Published a paper on "Inertial Sensors Based Gesture Recognition" in International Journal of Advanced Electrical and Electronics Engineering (IJAEET) in Sept 2016 Vol 5 Issue 2, ISSN: 2278-8948 & ISO 9001:2008.

EDUCATION

New York University Tandon School of Engineering, Brooklyn, New York**Aug 2018 – May 2020**

Master of Science in Computer Engineering

Courses: Real Time Embedded Systems | Computing System Architecture | Introduction to Operating Systems

Dwarkadas J. Sanghvi College of Engineering (DJSCE), Mumbai, India**July 2013 - May 2017**

Bachelor of Engineering in Electronics