

# ROHAN DVIVEDI

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[Github](#) [Linkedin](#) [Portfolio](#)

## EDUCATION

**Birla Institute of Technology and Science, Pilani - Hyderabad Campus**

2014-18

**B.E. Hons. in Mechanical Engineering - First Division** with 7.5 CGPA (of 10).

### Relevant Courses (in Computer Science)

Computer Programming I (CS F111)

Object-Oriented Programming and Design (CS F213)

Discrete Structures of Computer Science (CS F222)

Data Structures and Algorithm (CS F211)

Design Project (ME F366)(designing a pesticide spraying drone)

Digital Design (CS F215)

Microprocessors and Interfacing (CS F241)

Computer Architecture (CS F342)

FPGA Design (audited)

Digital Image Processing (EEE F435)

### Research Interests

**Systems Programming (in Linux), Computer Architecture, Computer Vision, Embedded systems, Robotics, and Databases.**

## RESEARCH

**Thesis: Flexible Processor Architecture Design (DOI)**, thesis advisor: Dr. Soumya J.

- Selected for presentation at International Conference [PEGPUM2018](#), UK, Manchester. 22<sup>nd</sup> Jan'18
- The [final research paper](#) was presented at [IEEE DISCOVER 2019](#), Manipal, India. 12<sup>th</sup> Aug'19
- The processor was prototyped using 74 series CMOS ICs and later using Verilog HDL.
- Youtube videos for [microcode programming](#), [executing add instruction](#), and [executing the Fibonacci sequence](#).

## WORK EXPERIENCE

**Software Development Engineer (SDE1) at OYO** (Hospitality industry)

### Teams

- Supply Tech. Team, Gurgaon, India Aug'18-Dec'18
- Finance Tech. Team, Gurgaon, India Jan'19-Jun'19
- OYO Vacation Homes ([Belvilla B.V.](#)), Amsterdam, Netherlands Jul'19-Feb'20

### Projects

- Implemented **price-drop and discounting** algorithm for [Belvilla website](#), **increasing conversion rate by 5.7%**.
- Developed tech-infrastructure to rent off properties that have been contracted with less renowned subsidiaries like [Dancenter](#) under OYO's brand name as [OYO Vacation Homes](#).
- Built FnB (Food-n-Beverages) microservice for accounting OYO's financial calculations (like commissions, taxes, and payments), and to generate and send reconciliation summary to Food-Vendors of OYO.
- Implemented a middleware in the Monolith application that eased switching between Monolith Datasource (PostgreSQL) to Microservices (HTTP APIs) as Datasource, easing OYO's transition from Monolith to Microservice architecture without affecting frontend HAML templates and HTTP API contracts (used by other teams).
- Built Geography microservice, providing HTTP APIs for executing consistent and hierarchial CRUD operations on geographical entities (Hotels, Hubs, Clusters) owned by OYO.
- Implemented Hotel leads deduplication algorithm, **a data cleaning algorithm** that discards leads that point to existing OYO hotels, *improving the efficiency of Business Development managers* to target hotel acquisitions. I was **honored to present the novel algorithm at the OYO CHECK-IN conference**, (Gurgaon) on 22nd Sept'19.

**Summer Intern at Bharat Dynamics Ltd. (Hyderabad)** (Defense Sector)

2<sup>nd</sup> Year UG

- Implemented embedded firmware for automation of an overhead crane that was used in the **Flow Forming Dept.**
- Report submitted: [Automation and retrieval of overhead crane](#).

## ACADEMIC PROJECTS

### Ball Following Robot

Jan'17-May'17

- Built a Robot, using **OpenCV** that can identify a TT ball and follow it, while focussing it. Built for evaluation in CS F241 course, under the supervision of Dr. Soumya J.. Documentation: Youtube [video](#).

### Pesticide Spraying Drone

Jan'17-May'17

- Built a Pesticide spraying drone ([report](#)) for evaluation in Laboratory Project course ME F366.

### Dextroid-The Humanoid Robot

Jan'16-Jul'17

- Implemented a ball detection algorithm using **OpenCV**, to locate a ball, chase it, and kick it. Blog reports: [Prototype 1](#), [Prototype 2](#), and [Prototype 3](#) and Youtube [video](#).
- Funded twice (**total amounting to 175,000₹**) under *Student Innovative Projects (SIP)* scheme by the university.

## HONORS AND AWARDS

- Awarded as **"The Best Presenter"** at the IEEE DISCOVER 2019 conference on 12<sup>th</sup> Aug'19 for my thesis presentation.
- Honored as **"Rockstar Performer"** at OYO, Gurgaon office, in the appraisal cycle for the financial year 2018-19.

## PARTICIPATION IN ROBOTICS COMPETITION

### **Magneto event(competition), Techfest IIT Bombay, 2015**

2<sup>nd</sup> Year UG

- Built a **Hand gesture controlled robot** to grab and launch TT balls accurately towards the target.
- Blog [report](#) and Youtube: [video1](#) and [video2](#)

## PARTICIPATION IN PROJECT EXHIBITION

### **QuarkExpo2016, ATMOS 2016**

3<sup>rd</sup> Year UG

- Built a **Piezo-electric Footstep Power generator**. Blog [report](#).

### **Techtainment Event, ATMOS 2015**

2<sup>nd</sup> Year UG

- Built a **Persistence Of Vision stick (with 8 LEDs)** displaying "ATMOS". Blog [report](#) and Youtube [video](#).
- Built an **indoor sonar system**. Blog [report](#) and Youtube [video](#).
- Built a **Robotic arm mimicking the mouse position** given by the laptop. Blog [report](#) and Youtube [video](#).

### **Techtainment Event, ATMOS 2014**

1<sup>st</sup> Year UG

- Built 2d 8x8 LED music visualizer. Blog [report](#) and Youtube [video](#).

## RESPONSIBILITIES

### **Founding member and Core-committee member of ARC (Automation and Robotics Club)**

2015-17

- Conducted Club Inductions (2015 and 2016) and Line Follower Robot Workshops (2015 and 2017) for freshmen.
- Built and presented projects in exhibitions; to acquire University funds essential for the functioning of the club.
- Organized and managed Techtainment Event in **ATMOS** ([Bits Pilani Technical festival](#)), in 2015 and 2016).

## PERSONAL PROJECTS ([Portfolio](#))

### **Systems Programming Projects (in Linux)**

- **serc**: Implemented an Http/Https (http/1.1) server and backend application development framework in C. The only dependencies it uses are **Zlib and OpenSSL**. Github: [serc](#) and [serc-template-application](#).
- **bufferpoolman**: A C library, designed to be used as a user-space buffer pool manager (page cache), to efficiently cache pages from a heap file, from SSD/HDD. it can be used for implementing a custom database. Github: [source](#).
- **Allok**: It is *binary search tree* based **generic memory allocator**. Github: [source](#).
- **Sloppy**: It is a *bitmap-based Slab memory allocator* inspired by **Jeff Bonwick's research paper**. Github: [source](#).
- **ConnMan**: A C Library, providing an abstraction layer over the Linux system sockets library to build multithreaded networking applications, using a network protocol-agnostic API. Github: [source](#).
- **BoomPar**: A C Library providing multithreaded job execution, similar to [ExecutorService in java](#). Github: [source](#).
- **Cutlery**: A C Library providing data structures that are frequently used in systems programming. Github: [source](#).
- **SimpleTupleStorageModel**: A C library to organize relational data on row-oriented slotted pages. Github: [source](#).
- **ReaderWriterLock** library: Github: [source](#).
- **JsonParser** library: Github: [source](#).
- **Neural Network Library** Github: [source](#).

### **Flight Controller Firmware Projects**

#### **QuadF32**

2019-20

- Implemented bare metal Flight controller firmware in C for quadcopter on a 72Mhz, 32-bit, ARM microcontroller (stm32f103). Github: [source](#) and Youtube: [description and working video](#) and [testbench video](#).
- **Learned to control program memory layout by using linker scripts and to code startup scripts for ARM SOC's.**

#### **Quadcopter**

4<sup>th</sup> Year UG

- Built a transmitter, receiver, and flight-controller firmware on a 16MHz, 8-bit, AVR ATmega328 microcontroller with Arduino bootloader. Github: [source](#) and Youtube: [video](#).
- **Learned to implement digital (soft) PID controllers, sensor fusion algorithms (Kalman and Complementary), and digital sensor filters on microcontrollers.**