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इंडियन प्रौद्योगिकी संस्थान धारवाड
Indian Institute of Technology Dharwad

Examination	University	Institute	Year	CPI / %
Graduation	IIT Dharwad	IIT Dharwad	2019	9.37
Intermediate/+2	HSC	PACE Junior Science College, Borivali	2016	93.30
Matriculation	ICSE	Cambridge School	2014	95.83

SCHOLASTIC ACHIEVEMENTS

➢ **Department Rank 1** in the Institute	
➢ Achieved **22 AA** grades: Digital Signal Processing, Signal and Systems, Probability and Random Process(stood **3rd** out of 80), Partial Differential Equation (stood **1st** out of 40), Data Analytics (**2nd** out of 113)	*[2017-19]*
➢ Acquired a rank of **2248** in JEE Mains 2016(out of **10 million** candidates)	*[2016]*

RESEARCH PROJECTS

Image Compression using Artificial Neural Networks   *Indian Institute of Science Bangalore*
Guide: Prof. Rajiv Soundararajan   *[June-July 2018]*

- Designed an image compression algorithm, using **Deep Convolutional Neural Networks**(DCNN) and compared with the state-of-art JPEG compression
- Worked on various approaches including **Generative Adversarial Networks**(GAN), **Recurrent Neural Networks**, and **Residual Neural Network**, for the above compression algorithm
- Implemented the encoder-decoder algorithm in **Keras**, using **TensorFlow**

Automatic White Balancing using Quality Measures   *Indian Institute of Science Bangalore*
Guide: Prof. Rajiv Soundararajan   *[June-July 2018]*

- Evaluated and looked into different features which an individual prefers in a set of photographs and checked for an opportunity, to white balance images based on the previous information
- Used Color Harmony as an entity, to perform aesthetic quality assessment

KEY PROJECTS

Federated Multi-Task Learning   *[Spring 2020]**
Guide: Prof B N Bharath   *Final Year Project*

- Designing a Federated Multi Task Learning algorithm with theoretical guarantees and using the data from multiple connected devices to tune a neural network model, specifically personalized to a particular user.
- Conducting novel research on using the concept of discrepancy to measure the dependencies between clients in the objective function and solving the optimization problem of maximizing the objective function, in a distributed fashion with limited communication(one-bit quantized gradient information)
- Performing experiments with respect to different data using TensorFlow Federated(TFF) and actively contributing to the library.

WiFi Sensing of the Environment   *[Autumn 2019]*
Guide: Prof B N Bharath   *Final Year Project*

- Developing mechanisms to allow an individual to monitor their health continuously, without any wearable
- Designing algorithms in C++ and Python to detect health metrics including breathing rate and heart rate using high frequency, wireless signals
- Conducting research and finding effective methods using Machine Learning, to use the collected data, to predict the sleep pattern and body movements of an individual and even check for unexpected health problems

Real Time Voice Tracking Camera
Guide: Prof S R Mahadev Prasanna

[Autumn 2018]
Course Project

- Developed a **mechanism**, to obtain audio signals, process them and thus, direct the web-camera towards the speaker
- Designed an algorithm, which processes the speech data in real-time, reduces the noise and accurately calculate the angle of motion, using Digital Signal Processing tools.
- Implemented this overall mechanism using **MATLAB**, Simulink and **Python**.

Machine Learning for Cancer treatment
Guide: Prof S R Mahadev Prasanna

[Autumn 2017]
Individual Project

- Designed and used Neural Networks and Machine Learning algorithms to classify cancer patients based on their gene sequences, so that personalized medication can be provided to them.
- Initiated my research using **k-means clustering** and **Stacked Auto-Encoders** and optimized it so as to get the most accurate results

WORK EXPERIENCE/OTHER PROJECTS

Software Developer - Nasdaq
[June-July 2019]
- **Created** an iMessage iOS Extension, which gives real time Stock Quotes, Market Data and News
- **Designed** the application from scratch using different design tools and frameworks like **Sketch**, Adobe XD and Figma
- Implemented the extension, along with additional novel features, using **Swift** and successfully came out with a product market fit **in under 2 months**

Machine Learning/Artificial Intelligence Intern - Emotix
[May 2019]
- Conducted research on Convolutional Neural Network based Face Detection System for Resource Constrained Devices
- **Implemented** various neural network models and algorithms including SSD and YOLOV3 using different Machine Learning Frameworks including **Tensorflow**, Keras, **PyTorch** and **Caffe**
- Developed an Android Application, with the **TensorflowLite** file of the model and successfully deployed the application on the robot with high accuracy

InterIIT Tech Meet | Bombay
[Dec 2018]
- **Led** a team of 10 and bagged the 2nd place among 23 IIT's who participated in the BeTiC Medical Innovation Challenge, to overcome the problem of tremors among people suffering from Parkinson's Disease
- **Designed** and **developed** a glove, with vibration motors, as a solution to enable the patients afflicted with Parkinson's to do their day-to-day task easily
- **Elected** as the contingent leader and led 28 students to participate and perform successfully in the Inter-IIT Tech Meet

InterIIT Tech Meet | Madras
[Dec 2017]
- **Led** a team of 8 members to come **5th** in the competition among 13 other IIT's, after participating for **the first** time in the competition
- Designed and structured an **autonomous hexacopter**(drone), which should continuously follow a line and decode QR codes, for the Inter-IIT TechMeet in IIT Madras
- Implemented **3D printing** and modelled a load bearing multicopter, which receives signals from the **DroneKit,** transmits via **MAVLINK,** to APM(Flight Controller**)** and controls the copter
- **Designed** an algorithm using **OpenCV**, to *process* the images with **Raspberry Pi**, and *detect the barcodes and QR codes*, using **ZXing** and **ZBar** Python Libraries

Innovation Cell, IIT-B | Summer Intern
[Apr-May 2017]
Guide: Prof Shabbir Merchant
- Bagged an **internship** at the Innovation Cell, to help build and **design new machines** for competitions
- Designed a Mechanical Gripper and a Holder, which was attached in the PackBot robot, which was going to be displayed at the Military Expo, September 2017
- Implemented a solution of using **suction cups** and **solenoid valves**, on a **spider bot**, to enable it to **climb** walls
- Re-designed and tested the body of a quadcopter, by simulating it under various *stress and strain situations*, using **ANSYS** and SolidWorks
- Designing and building a **walking stick**, to help **old** and **blind** people in heavy traffic situations

INTERESTS

Machine Learning and Neural Networks, Neuroscience, **Reinforcement Learning**, Robotics, Signal Processing , Statistics and Data Analysis, **Probability Theory**, Communication System

POSITION OF RESPONSIBILITY

General Secretary Technical Affairs   [*Jan 2017-May 2019*]
- Elected as the **First Ever** *General Secretary- Technical Affairs* of the institute from over 200 students
- Conducted **talks** for the tech-savvy community, focused on solving **the society's problems** using technology
- Organized a **workshop**, for **over 100 students**, for hands on training using **Arduino** board
- Initiated **competitions** to *build machines to play games* like ice hockey, football and **RoboWars**

Institute Robotics Secretary   [*Oct 2016-May 2019*]
- Pioneered weekly **'Robotronics' sessions**, to interact with robotics-enthusiasts and discuss new ideas
- Facilitated the **development** of the **Robotics Lab**, in the institute, to work towards technical development

Student Mentor Coordinator   [*Nov 2017-May 2019*]
- Among the **3 selected** out of 120 second year students, *to lead a team* of 18 sophomore students to help the first-year students, cope up with the academics, hostel life and social culture in the institute

Department Student Representative   [*Aug 2016-Aug 2018*]
- Selected **among the 40 students** in the department, to present concerns, of the students to the respective faculty

TECHNICAL SKILLS

Programming Languages : C, C++, Java, Python, Swift
UI/UX Tools : Figma, Sketch, Zeplin
Web Development: HTML-CSS, Bootstrap, JavaScript
Software Skills: MATLAB, Simulink, AutoCAD, SolidWorks, LaTeX, OpenCV, SPICE, GNU Radio
Hardware Skills: Arduino, Raspberry Pi, **APM** for multirotor, **VHDL**

EXTRA-CURRICULAR ACTIVITIES

Indian Youth Delegation to China   [*July 2018*]
- Selected among 200 candidates from the country, by the government of India, to be a part of the Indian Youth Delegation to China
- Interacted with the students and esteemed professionals of China, to come up with ideas to solve large scale problems

Event Management   [*Aug 2016-Present*]
- Arranged an *inter department quiz* competition, attended by **over 100** students, and represented my department, winning **the 2nd** prize and, stood **1st** in the same competition this year.
- Facilitated and attended various lectures on different topics, ranging from **psychology**, **mathematics**, **renewable energy generation, use of artificial intelligence in defence,** to understand those areas better

Sports Participation   [*March 2017*]
- Represented the institute in **Badminton**, for an inter-collegiate competition, Aavhan held at IIT-Bombay
- Selected as the goalkeeper of the institute football team

INMUN (Indian Model United Nation)   [*Aug 2013*]
- **Among the 4 students selected** out of over 300 students, to represent the school in the **MUN** (Model United Nation), held in Delhi, to represent the country of Lebanon, on the front of **Disarmament** and International Security

- Appointed **Deputy Speaker**, in the Student Council of the school, and have headed 2 General Assemblies
- Proficient in playing the **Piano** and have learnt classical music for 6 years
- **Avid Reader**, with thorough liking for autobiographies and sci-fi novel