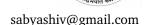
Sabyasachi Shivkumar | EE12B135

INDIAN INSTITUTE OF TECHNOLOGY MADRAS

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EDUCATION

Program	Institution	%/CGPA	Year of completion
B.Tech in Electrical Engineer- ing and M.Tech in Applied Me- chanics with specialization in Bio-Medical Engineering	Indian Institute of Technology Madras, Chennai	8.86*	2017
XII	National Public School Rajaji Nagar, Bangalore	94.80	2012
X	Delhi Public School,Bangalore North	9.8	2010
*-After Four Semesters			

THEORY COURSES

- Analog and Digital Signal Processing
- Networks and Systems
- Introduction to Machine Learning*
- Probability, Statistics and Stochastic Processes
- Control Engineering*
- Introduction to Bioinformatics and Computational Biology*

- Digital Circuits and Systems
- Computer Organization and Architecture
- Graph Theory
- Electrical And Magnetic Circuits
- Analog Circuits*
- Machine Learning(Online on Coursera)

LABORATORY COURSES

- CAD Lab(Numerical Computation)
- Digital Circuits Lab

- Microprocessors Lab*
- Electrical Machines Lab*

INTERNSHIPS

HEALTHCARE TECHNOLOGY INNOVATION CENTRE (HTIC)

(MAY-JUL 2014)

- Worked on the reduction of motion artifact from Photoplethysmogram(PPG) signals for a wearable health monitor. Generated a dynamic noise model and used Least Mean Square Adaptive filters to remove the in band noise
- Developed a tap detection and basic gesture control algorithm for the wristwatch and tested it on real time data using Labview
- Implemented various heart rate detection algorithms and evaluated their performance using real-time data.
- Implemented the reconstruction and heart rate calculation in C using the ARM CMSIS library. Implemented the dynamic filter model using a novel pseudo-filtering technique

• DHVANI RESEARCH-IITM RESEARCH PARK

(DEC 2013)

- Extracted the contour points from a fluoroscent illuminated crack in an image and used ray-tracing to get the corresponding 3D points
- Developed a curve fitting model and algorithms to determine the length and width of the crack
- Developed a code to convert a rotation-translation matrix to view matrix used in OpenGL

^{*-} Ongoing Courses

- Coding in C, C++,Python and Android application development using Java.
- Numerical Computation using Matlab,Octave and Numerical Python
- Image Processing using OpenCV and Matlab.

- Web Development using HTML,CSS,Javascript etc.
- Basic Sound Processing using libsndfile and Matlab.
- · Verilog, HDL and Arduino Coding

PROJECTS

• IMAGE BASED AUGMENTED REALITY USING OPENCY

(FEB-APRIL 2013)

- Developed an application that detects known pattern in live video feed and replaces it with another pattern.
- Implemented rotation and scale invariant detection.
- AIR HOCKEY PLAYING ROBOT (AS PART OF YOUNG INNOVATOR'S PROGRAM CENTRE FOR INNOVATION(CFI), IIT MADRAS) (MAY-AUGUST 2013)
 - Designed an air hockey playing robot. The prototype robot consisted of a two arm-four bar mechanism.
 - The image processing from the overhead camera was done using opency and the optimum angles for the arm were determined mathematically.
 - The data was then passed through the serial stream to the Arduino Uno which controls the movement.
- CIRCUIT ANALYSER- COMPUTER VISION PROJECT

Ongoing - From April 2014

- Developing a mobile application that takes in an image of a circuit, detects elements, reconstructs the circuit and solves
 it
- Implementing Machine Learning algorithms for classification of circuit elements
- Developed a circuit solver to solve circuits using Modified Nodal Analysis
- WEBCAM BASED HEART RATE DETECTION

(JUNE 2014)

- Acquired Photoplethysmogram(PPG) signals from finger kept on top of webcam
- Calculated Heart rate from the acquired signals
- VIRTUAL LAB PROJECT UNDER PROFESSOR NITIN CHANDRACHOODAN ONGOING FROM MAY 2014
 - Developing a web application that constructs and simulates circuits with digital and analog ICs
 - Implemented an interactive frontend model, where the user can drag and drop the various element imitating an actual circuit as close as possible
 - Implementing transistor modeling of ICs to account for non-ideal behavior
- Pushpin art generator

(February 2014)

- Generates a pushpin art of a given image. Program takes the image as an input and returns a csv file containing the positions and colour of the pins.
- PORTABLE EEG MACHINE (ONGOING PROJECT)

Ongoing - From March 2014

- A long term project aimed at building a portable EEG machine and using the data todevelop a brain computer interface
- Configured a data acquisition system using ADS1298 and processing signals
- DIGIT RECOGNITION (MINI PROJECT AS PART OF MACHINE LEARNING COURSE ON COURSERA) 2014
 AUGUST
 - Trained a single hidden layer neural network with each pixel value of a 20X20 grayscale image taken as features
 - Built a module that takes in an image of a number, filters the image and predicts the output with 95% accuracy

INTERNATIONAL COMPETITIONS

• MEMBER OF TEAM SAHAS* (IMAGE PROCESSING)

- ONGOING-FROM NOV 2013
- Built an user interface for automatic calibration of colors to filter the received video feed
- Worked on a Virtual Lighting System to make the lighting uniform
- Developing artificial intelligence strategies to make robots play soccer effectively
- * Sahas is a 15-member team representing IIT Madras in Mirosot, an international Robot Soccer contest to be held in Beijing organised by FIRA.

SCHOLASTIC ACHIEVMENTS

- Ranked 4203 in IITJEE 2012 examination(Top 1% of the country)
- Nominated to receive INSPIRE Scholarship for top 0.1 percentile in AISSCE and school topper in Computer Science subject in class 12th AISSCE
- Having a CGPA of 10 in all Core Lab Courses
- Centre Topper(Team) in MIMAMSA 2014 (Science Quiz by IISER Pune)

POSITIONS OF RESPONSIBILITY

STUDENT-IN-CHARGE OF ELECTRICAL ENGINEERING ASSOSIATION

MAY 2014-PRESENT

- Electrical Engineering Assosiation is a student body that organizes various activities like Hackathon, Webinars and Lecture series for Electrical Engineering students with faculty support
- TECHNICAL AFFAIRS VOLUNTEER NARMADA HOSTEL

(2013)

- Cube Open Volunteer Shaastra 2013 and Newsletter Volunteer Saarang 2013 (2013)
- EDITOR CHENNAI36, THE ALUMNI BLOG OF IIT MADRAS

(Jan 2014 onwards)

EXHIBITIONS COORDINATOR (EVOLVE) SHAASTRA 2014

(2014)

CO-CURRICULAR AND EXTRA-CURRICULAR ACTIVITIES

- Winner of Puzzle Champ in Shaastra 2013
- Winner of Annual Electrical Engineering Hackathon 2014 Developed a user interface for circuit solver
- Winner of Puzzle Champ in Shaastra 2014
- Music
 - Playing the keyboard for 10 years with 3 years of formal training.
 - Learnt Hindustani music for 2 years. Was part of the school choir.
- · Cooking-Cook a variety of cuisines and working on a cookbook
- NSS volunteer as a part of English For Communication group