



Sourabh Singh
Computer Science & Engineering
Indian Institute of Technology Bombay

150050009
UG Third Year (B.Tech.)
Male
DOB: 25-05-1998

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2018	7.82
Intermediate/+2	Pace Junior Science College	Pace Junior Science College	2015	85.23
Matriculation	St. Judes High School	St. Judes High School	2013	92.73

Pursuing **Honours** in Computer Science and **Minor** in Humanities and Social Sciences

INTERNSHIPS

Game Engine Development

May-June 2017

Ubisoft

Pune

- Designed 2D Game engine from scratch in C++11 consisting of Rendering & Physics Engine and State Manager
- Developed Rendering Engine using **DirectX** besides HLSL for shaders providing more graphical elements
- Optimised Physics Engine using Rvalue, Quadrees for collision detection, and other inspirations from Box2D
- Implemented ideas from different Design Patterns like Factory, Singleton to create game with Haaf game engine

Software Development and Research Intern

December 2016

Wellthy Therapeutics

Mumbai

- Engineered a raw chat system based on the **MQTT** protocol using *Mosquitto* as a MQTT broker
- Analysed its efficiency against traditional protocol based chat application provided by various companies
- Implemented User-Agent assignment system with Amazon's **Dynamodb** database and other web services

COURSE PROJECTS

Aarohi - Music Generating bot

Spring 2017

Guide: Prof. Ganesh Ramakrishnan

IIT Bombay

- Trained models using **Keras** to synthesize music using RNN with LSTM Cells to track long term patterns
- Dataset were MIDI files of Bach Chorales converted to Piano-Roll, a more structured and intuitive format
- Analysed the melody using mathematical models like Chromograph, Tempograph, and Recurrence Matrix

Echo - Messaging Application

Spring 2017

Guide: Prof. Varsha Apte

IIT Bombay

- Designed a C++ chat application with socket programming and multithreading on Linux for only shell
- Included features such as Online-Offline user, MultiUser Login, Last seen, and History of all conversations
- User interface was completely terminal based handled by **Ncurses** with different themes to choose from

ATM Controller - VHDL

Spring 2017

Guide: Prof. Supratik Chakraborty

IIT Bombay

- Engineered a ATM Controller for FPGA board, capable to withdraw and deposit cash connected to server
- Server maintained account balances and imposed restriction on cash dispensed over TEA encrypted channel
- Implemented **Least Recent Used** caching algorithm for transactions when contact with server fails

Feed'er - Time Table App

Autumn 2016

Guide: Prof. Sharat Chandran

IIT Bombay

- Developed an android application to notify students for upcoming projects and assignment deadlines
- Implemented a platform for professors to collect realtime feedback from students regarding course
- Included a forum for instructor to update assignments, projects, quiz schedules using Django

Checkers

Autumn 2015

Guide: Prof. Varsha Apte

IIT Bombay

- Built the Checkers game using **Simplecpp** library for User Interface and other graphical elements
- Included Two-player and Single-player mode with an AI implemented using **first level depth** search
- Evaluated and displayed validity of moves, and suggested all possible moves for the player to play

SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 599** in JEE Advanced amongst 150,000 candidates 2015
- Recipient of the Kishore Vaigyanik Protsahan Yojana Scholarship with **All India Rank 88** 2013
- Achieved **99.99** percentile in JEE Main out of 1.4 million candidates 2015
- Successfully cleared **Indian National Mathematics Olympiad** twice 2012, 2013
- Awarded National Talent Search Examination Scholarship being among **top 1000** all over India 2012
- Participated in National Science **VIJYOSHI** camp organized by KVPY 2014

SELF PROJECTS

FirstPersonShooting Game

Summer 2016

- Developed multiplayer game inspired by CounterStrike with **Unity5** game engine and **C#** scripting language
- Introduced animations for headbob, crouch, jump, reload-recoil and for power ups like speed, damage boost

Movie Recommendation Engine

Autumn 2016

- Developed a movie recommendation engine in **Python** using collaborative filtering technique
- Primarily using **Euclidian distance** and **Pearson Correlation** to find the most relevant movies
- Based on the input preferences of user, pool of movies and your ratings, movies are recommended to users

Line Follower

Spring 2016

- Bot with Differential Steering, IR sensors for detecting orientation, and AVR microcontroller for Path correction
- Secured **Second Position** in the competition conducted by Robotics Club, IIT Bombay

Others

- 3D replication of famous game Tank in Unity each player has a tank that can fire shell any direction it wants
- **Bluetooth Control Bot**: A bot controlled by app via bluetooth module, with 12V battery and 4-wheel drive
- Modified version of the famous Breakout game, consisting of attractive/repulsive magnets using Box2D

TECHNICAL SKILLS

Programming	C, C++, Java, Python, Bash, SQL, HLSL, C#, R ,VHDL
Development	JavaScript, Django, Spring Framework, HTML5, CSS
Softwares	Git, Unity3D, UnrealEngine, Andriod Studio, DirectX, OpenGL, \LaTeX , Makefiles, Wireshark, AutoCAD & Solidwork

KEY COURSES

Theoretical CS	Data Structures and Algorithms, Discrete Structures, Data Analysis and Interpretation, Design and Analysis of Algorithms, Digital Logic Design, Logic for Computer Science, Computer Networks, Introduction to Machine Learning, Computer Graphics
Systems	Software System, Database, Operating Systems, Network Security, Computer Architecture
Mathematics	Calculus, Linear Algebra, Differential Equations

EXTRACURRICULARS

- Completed course to learn Elementary German (*Deutsch*)
- Participated in Microsoft's **Code.Fun.Do** boot camp with a game built using Unity5
- Designed a responsive website using Materialize templates and HTML5 with on the fly form validation
- Engineered an aeromodel with pusher configuration for RC plane competition
- Swam **20.4 km** in 12hrs in the Swimmathon 2016 conducted by IITB Aquatics Club
- Instructed and performed at Institute Salsa Night, 2016 with an audience of 1000+ people
- Showcased dance performances in the Annual InSync Dance Show, 2017 in front of 3000+ audience