Rishabh Shah

4TH YEAR UNDERGRADUATE · COMPUTER SCIENCE & ENGINEERING

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Education

Bachelor of Technology, IIT Bombay   *Mumbai, India*

COMPUTER SCIENCE & ENGINEERING   *July. 2015 - PRESENT*

- GPA: 9.60/10.00 (after six semesters)
- Pursuing Honors in Computer Science and Engineering
- Pursuing Minor in Applied Statistics and Informatics

Pace Junior Science College (HSC)   *Mumbai, India*

INTERMEDIATE/+2   *May. 2015*

- Percentage: 92.31 %

Ryan International School (CBSE)   *Mumbai, India*

MATRICULATION   *May. 2013*

- GPA: 10.0/10.0

Interests

- Artificial Intelligence
- Computer Graphics
- Machine Learning

Research Experience

Skill development for Robots   *IIT Bombay*

GUIDE: PROF SHIVARAM KALYANAKRISHNAN   *Autumn '18 - Ongoing*

- Training humanoid robots to acquire basic soccer skills using *Reinforcement Learning* for RoboCup competition
- Designing Neural Networks to implement *Policy Gradient Algorithms* for Reinforcement Learning
- Implementing reward functions to make the robots learn by imitating motion clips

Photorealistic rendering for Augmented Reality   *IIT Bombay*

GUIDE: PROF PARAG CHAUDHURI   *Spring '18*

- Designed an AR application using Simultaneous Localization and Mapping in *OpenGL* and *OpenCV C*++
- Implemented User Interface for addition of custom synthetic meshes to appropriate location in real environment
- Devised mechanism to recognize previously seen environments and re-display the augmentations appropriately
- Explored methods to capture the light models from RGB images to coherently render the synthetic objects

Scholastic Achievemnts

2018	**Department Rank 6**, in a batch of 121 students
2018	**Institute Academic Award**, IIT Bombay for exceptional academic performance
2015	**All India Rank 55**, in IIT JEE Advanced amongst $150,000$ candidates
2015	**All India Rank 79**, in JEE MAIN out of $1.3\ million$ candidates
2015	**Gold Medal**, for being amongst the $Top\ 35$ students in *Indian National Chemistry Olympiad*
2013	**All India Rank 74**, Recipient of Kishore Vaigyanik Protsahan Yojana $(KVPY)$ Scholarship
2013	**All India Rank 17**, in 15th National Science Olympiad (NSO) by Science Olympiad Foundation

Work Experience

Tower Research Capital   *Gurugram, India*

SOFTWARE DEVELOPER INTERN (TRADE PLATFORM)   *Summer '18*

- Designed an end-to-end testing framework in *C++* for verifying transaction orders and their expected outcomes
- Implemented modules for integrating this new design in current repositories using *Behave framework in Python*
- Created jobs in *Jenkins* to automate testing on changes made by developers in relevant code
- Auto-generated reports enabling easy debugging for developers and smooth analysis by users

PartsAvatar Incorporated   *Canada*

SOFTWARE DEVELOPER INTERN   *Summer '17*

- Devised an algorithm for the classic *Multidimensional Bin Packing* problem in *Java* to pack ordered items in boxes
- Improved packaging cost under the constraints of available shippers and, size & weight bounds
- Optimized the allocation of orders to required warehouses under total cost, time, and distance constraints
- Designed web application for displaying an interactive animation of packed items using *JavaScript*

Edelweiss Financial Services Limited   *Mumbai, India*

SOFTWARE ENGINEER INTERN (GLOBAL RISK GROUP)   *December '16*

- Analyzed market data and developed a *Lead Indicator* to predict peaks and falls in the market economy
- Devised a simulation that filters trading order requests by calculating risk utilization
- Designed dashboards in *Java*, that give summary of algorithmic trading on daily basis

Academic Projects

Simulation of liquids using surface-only data   *Advanced Computer Graphics*

GUIDE: PROF PARAG CHAUDHURI   *Spring '18*

- Simulated incompressible, inviscid and uniform-density liquids using only surface velocities and locations
- Incorporated forces of gravity, surface tension and internal pressure forces in propagating the surface
- Implemented physics engine to simulate phenomenon of dripping and sphere formation under zero gravity

Compiler for C subset   *Implementation of Programming Languages*

GUIDE: PROF UDAY KHEDKAR   *Spring '18*

- Created a compiler for C language to generate x86 assembly code using *Python Lex and Yacc*
- Designed abstract syntax trees and control flow graphs for various C control structures
- Handled shift reduce conflicts and designed unambiguous grammer for all syntax rules

Keyframe Animation   *Computer Graphics*

GUIDE: PROF PARAG CHAUDHURI   *Autumn '18*

- Designed an interactive modelling tool in C++ OpenGL to create 3D models from triangle meshes
- Implemented modelling-viewing pipeline to convert the scene from 3D perspective to 2D planar view
- Created a story-line and animated 3D models designed from scratch in *OpenGL* using keyframe interpolation

Movie Success Predictor   *Foundations of Machine Learning*

GUIDE: PROF GANESH RAMAKRISHNAN   *Spring '17*

- Analyzed the movie success patterns and indicators, and designed models to predict movie success
- Built *Web Scrapers* in *Python* to get training data from sites like Wikipedia and Rotten Tomatoes
- Implemented, tested and compared various *Machine Learning* techniques like *Neural Networks*, *Decision Trees*, *Random Forests* and *Support Vector Machines*

Echo: Terminal based chat application   *Computer Networks*

GUIDE: PROF. VARSHA APTE   *Spring '17*

- Designed a chat application using *Socket Programming* in *C++* remodeling the Linux shell interface
- Implemented *Multi-Threading* for parallelization of input-output operations and background communication
- Incorporated status tracking functionality including online, offline, and last seen statuses

ATM Controller Simulation   *Digital Logic Design*

GUIDE: PROF. SUPRATIK CHAKRABORTHY   *Spring '17*

- Designed *VHDL* modules to handle user input and cash dispensing operations in *Xilinx ISE Design Suite*
- Built backend for user authentication and secure communication in *C* language
- Implemented functionality of caching transaction details in offline mode and synchronization with backend

Feeder: Timetable and Notification App

Sofware Systems Lab

Guide: Prof. Sharat Chandran

Autumn '16

- Designed an *Android Application* that maintains a calendar-like setup for college students
- Developed backend and web interface for the application in *Django*
- Implemented functionality for regular update on information regarding course events and deadlines

Blackjack

Computer Programming and Utilization

Guide: Prof. Varsha Apte

Autumn '15

- Designed *Advanced Blackjack* game using the *SimpleCPP* graphics library in *C++*
- Implemented basic artificial intelligence to suggest players the best move
- Added essential features *Hit*, *Stand* and *Splitting Pairs*

Technical Skills

Programming Languages	Proficient in C++, Familiar with Python, Java, R, Bash, MATLAB, VHDL
Web Development	Proficient in Django, HTML, CSS, Familiar with Javascript, JQuery
Softwares	Android Studio, Git, OpenGL, Blender, Makefiles, CMake, OpenCV, Unity3D

Relevent Courses

Foundations of Intelligent and Learning Agents	Digital Image Processing
Artificial Intelligence	Advanced Computer Graphics
Foundations of Machine Learning	Data Analysis and Interpretation
Statistical Inference	Regression Analysis
Data Structure and Algorithms	Design and Analysis of Algorithms

Positions Of Responsibilities

Teaching Assitant

IIT-Bombay

- Responsible for clarifying queries of students in discussion forums and labs, helping with the creation of course material
- Courses Taught - Object Oriented Programming (2017), Operating Systems (2018)

Extracurricular Activity

- 1st position in Football tournament organized within Computer Science and Engineering department — 2018
- Runner up in competition for building an Autonomous Bot to navigate along any curved continuous path — 2016
- Awarded Tech Special Mention certificate from Hostel 3, IIT Bombay — 2016
- 2nd position in Logic General Championship by Maths and Physics Club, IIT Bombay — 2016
- Played Flute in our band and secured 1st position in InterHostel Sophie Music League — 2016
- Completed a year long course in Table Tennis by National Sports Organization — 2015-16
- 1st position amongst freshers in Freshiezza Group Dance Competition — 2015