Rishabh **Shah**

QUANTITATIVE RESEARCHER · WORLDQUANT RESEARCH INDIA · B.TECH, IIT-BOMBAY (MAJOR IN COMPUTER SCIENCE)

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Summary

Presently working as Quantitative Researcher at Worldquant Research India Pvt Ltd.
B.Tech from Indian Institute of Technology Bombay, with Major and Honors in Computer Science and Engineering.
Major Interests :   Artificial Intelligence, Machine Learning, Data Analysis and Algorithm Design, Computer Graphics

Research Experience

Skill development for Robots   *IIT Bombay*
GUIDE: PROF. SHIVARAM KALYANAKRISHNAN   *Jul. 2018 - Apr. 2019*

- Successfully trained humanoid robots to acquire basic skills like waving, squats and walking using *Reinforcement Learning*
- Designed *Neural Networks* to implement *Policy Gradient Algorithms* for Reinforcement Learning
- Implemented reward functions to make the robots learn by imitating motion clips

Photorealistic rendering for Augmented Reality   *IIT Bombay*
GUIDE: PROF. PARAG CHAUDHURI   *Jan. 2018 - Apr. 2018*

- 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

Work Experience

Worldquant Research India Pvt Ltd   *Mumbai, India*
QUANTITATIVE RESEARCHER   *Jul. 2019 - PRESENT*

- Developing *Natural Language Processing* techniques to create quantitative strategies using text data
- Extensive coding in *C++* to make strategies to capture market inefficiencies in various major regions across the globe
- Building quantitative models using Price-Volume data, Fundamental data and insights from various research sell-side firms

Tower Research Capital India Pvt Ltd   *Gurugram, India*
SOFTWARE DEVELOPMENT INTERN (TRADE PLATFORM)   *May. 2018 - Jul. 2018*

- 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   *Mumbai, India*
SOFTWARE DEVELOPMENT INTERN   *May. 2017 - Jul. 2017*

- 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 Ltd   *Mumbai, India*
SOFTWARE ENGINEER INTERN (GLOBAL RISK GROUP)   *Dec. 2016*

- 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

Skills

Programming Languages	C++, Python, Java, C#, R, MATLAB, VHDL, Bash
Web Development	Django, HTML, CSS, Javascript, JQuery
Softwares and Tools	Android Studio, Git, OpenGL, Blender, Makefiles, OpenCV, Unity3D

Education

Indian Institute of Technology - Bombay
B.tech in Computer Science and Engineering

- Graduated with Major and Honors in Computer Science and Minors in Applied Statistics and Informatics
- CGPA : 9.60/10.00

Mumbai, India
Jul. 2015 - Aug. 2019

Pace Junior Science College (HSC)
Intermediate/+2

- Percentage : 92.31 %

Mumbai, India
May. 2015

Ryan International School (CBSE)
Matriculation

- CGPA: 10.00/10.00

Mumbai, India
May 2013

Academic Projects

Simulation of liquids using surface-only data
Guide: Prof. Parag Chaudhuri

- 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

Advanced Computer Graphics
Spring '18

Compiler for subset of C
Guide: Prof. Uday Khedkar

- 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 control structures
- Handled shift reduce conflicts and designed unambiguous grammar for all syntax rules

Compilers
Spring '18

Keyframe Animation
Guide: Prof. Parag Chaudhuri

- 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

Computer Graphics
Autumn '17

Movie Success Predictor
Guide: Prof. Ganesh Ramakrishnan

- 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*

Machine Learning
Spring '17

Echo: Terminal based chat application
Guide: Prof. Varsha Apte

- 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

Computer Networks
Spring '17

Simulation of liquids using surface-only data
Guide: Prof. Supratik Chakraborthy

- 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

Digital Logic Design
Spring '17

Feeder: Timetable and Notification App
Guide: Prof. Sharat Chandran

- 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

Software Systems Lab
Autumn '16

Blackjack
Guide: Prof. Varsha Apte

- Designed Advanced Blackjack game from scratch using the *SimpleCPP* graphics library in C++
- Implemented card counting helper to suggest players the best move
- Added essential features Hit, Stand and Splitting Pairs

Computer Programming
Spring '16

Scholastic Achievements

2019	**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 Medalist,** for being amongst the Top 35 students in Indian National Chemistry Olympiad
2014	**All India Rank 74,** Recipient of Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarship
2013	**All India Rank 17,** 15th National Science Olympiad (NSO) by Science Olympiad Foundation

Positions Of Responsibilities

Teaching Assistant   *IIT Bombay*

- Responsible for clarifying queries of students in discussion forums and labs.
- Helping with the creation of course material, including labs, grading and testing scripts
- Courses Taught :- Object Oriented Programming in C++ (2017), Operating Systems (2018), Artificial Intelligence (2019)

Relevant Courses

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

Extracurricular Activity

2018	**Qualified,** for International Collegiate Programming Contest (ICPC) regional onsite round
2018	**Winner,** in Football tournament organized within Computer Science and Engineering department
2016	**Runner up,** in competition for building an Autonomous Bot to navigate along any curved continuous path
2016	**1st position,** in Inter-Hostel Sophie Music League, playing Flute in our band
2016	**2nd position,** in Logic General Championship by Maths and Physics Club, IIT Bombay
2015	**1st position,** amongst freshers in Freshiezza Group Dance Competition