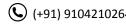
Rajat Singhal | CS17B042

Indian Institute of Technology Madras







EDUCATION				
Program	Institution	CGPA/%	Year	
B. Tech in Computer Science & Eng.	Indian Institute of Technology, Madras	8.21/10	2021	
XII (HSC)	Divyapath Campus, Ahmedabad	91.4%	2017	
X (SSC)	Asia English School, Ahmedabad	87.8%	2015	
National Winners of Microsoft CodeFunDo++ Challenge 2018, with a cash prize of Rs. 500,000 p S5000 Azura Cloud Credits & Alfor Earth Grant for the HAVs for Disaster Management project				

Scholastic **Achievements**

- \$5000 Azure Cloud Credits & **AI for Earth Grant** for the **UAVs for Disaster Management** project
- Secured All India Rank 158 in JEE-Advanced '17 among 150k candidates
- Ranked amongst the top 1% nationally in National Standard Examination in Chemistry (NSEC)'16
- Received Kishore Vaigyanik Protsahan Yojna (KVPY) 2016 fellowship

WORK EXPERIENCE

Disney+ Hotstar Software Engineering Intern April'20 - June'20

- Enhanced monitoring & alerting of events, by integrating Amplitude & Prometheus platforms
- Improved granularity for setting alerts from hourly to 5 min & increased limitations of 10 metrics to 300 metrics, with an error rate of ~5% by deployment of the developed Python services
- Designed a generic streaming pipeline to process raw events using Apache Spark & Kafka
- Defined a simple interface for Playable Ads & implemented on a demo Android app + advertisement

Google Summer of Code

ArduPilot.org May'19 – Aug'19 Mentors- Andrew Tridgell, Peter Barker

- Developed the ArduPilot-AirSim integration, using BSD sockets for the firmware-simulator interface
- Wrote a minimalistic JSON parser in C++ for sub-millisecond processing of packets
- Ensured cross-platform integration and tested on Windows, Linux & macOS systems

UAVs for Disaster Management Center for Innovation, IITM Feb'18 - Dec'19

PROJECTS

Swarm of Autonomous Drones equipped with Computer Vision & AI for locating people in disasters

- Tested 3D Obstacle Avoidance Algorithms using Stereo & Depth Cameras in simulations, hardware
- Integrated Path-Planning algorithms to achieve autonomous surveillance of a large region
- Achieved live-video transmission over WiFi & GSM network using FFmpeg and Azure Media Services
- Among the Top 10 winners of India Innovation Growth Programme (IIGP) 2.0 University Challenge **2019** with an award prize of Rs. 1,000,000

Avishkar Hyperloop Center for Innovation, IITM Dec'17 - Sep'18

Student team spearheading the country's attempt at SpaceX Hyperloop Pod competition

- Developed the control systems architecture, optimizing the no. of on-board computers & sensors
- Implemented and tested different communication protocols such as LCM² over UDP
- Identified several critical single-point-of-failures, resulting in inclusion of pneumatic friction braking

Map-Reduce on GPU **GPU Programming Course** July'20

- Implemented KMeans, Monte Carlo Pi estimation following Map-Reduce framework on GPU
- Wrote a generic Map-Reduce template with disjoint input & output memory regions for coalesced access, along with individual customization for better performance
 - Benchmarked the programs against sequential CPU and OpenMP parallelized implementations

Twitter Web-App Cloud Computing Course July'20

- Wrote a Kafka + Spark Streaming program to fetch tweets and publish as Kafka topics, with Spark Streaming + MLlib for performing analysis such as WordCount, Frequent Pattern Mining
- Deployed the web-app on multiple AWS instances with Flask-based interface for viewing results

MiniJava to MIPS Compiler Design Course Aug'19 - Nov'19

- A 5-pass compiler implemented in Java, translating a MiniJava program to increasingly lower abstraction forms, finally resulting in MIPS assembly language
- It also performed type-checking, intermediate code generation & optimized register-allocation

	COURSEWORK & SKILL
Design & Analysis of Algorithms	Database Management*

Design & Analysis of Algorithms	Database Management*	Cloud Computing
Operating Systems	Systems Eng. for Deep Learning*	GPU Programming
Blockchain and Distributed Ledgers*	Pattern Recognition & Machine Learning	CNNs ¹ for Visual Recognition**

SKILLS

- Programming: C, C++, Python, Java, Shell Scripting, JS, Go, Scala, OCaml, x86 Assembly
- Softwares: Git, Docker, Kubernetes, Apache Hadoop, Spark, Kafka, Flink, Robot Operating System
- Others: AWS, TensorFlow, OpenCV, CUDA, Thrust, Travis CI, NumPy, Flask

EXTRA-CURRICULAR ACTIVITIES

Open-Source Contributor

- Contributed several new features, bug-fixes, unit-testing, CI/CD³ & documentation. Notable projectso AirSim: Cross-platform, visually realistic robotics simulator based on Unreal Engine & Unity
 - o ArduPilot: Advanced autopilot software system. Maintainer of the AP-AirSim integration

Miscellaneous

- Part of the 7th Inter IIT-Tech Meet IITM contingent for the Pluto-X Drone Challenge
- Volunteer at Exebit 2018, CSE Dept fest, helped organize an introductory workshop on Python
- Associate Manager at Entrepreneurship Cell, Conceptualized and organized Inspirit
- * ongoing; ** online; ¹Convolutional Neural Networks; ²Lightweight Communications & Marshalling; ³Continuous Integration/Continuous Deployment