Jay Bansal
Computer Science & Engineering
Indian Institute of Technology, Bombay

193050004
M.Tech.
Gender: Male
DOB: 07-05-1999

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2021	9.75
Graduation	JNV Univ. Jodhpur	MBM Engineering College Jodhpur	2019	9.02

Scholastic Achievements

- With score of 1000, secured **All India Rank 2** in GATE CS 2019 among 99,932 candidates
- Department **Gold medalist** in B.E Computer Science, with CPI of 9.02
- Department **rank 1** among all M.Tech CSE candidates with CPI of 9.75
- Secured **All India Rank 39** in ACM-ICPC online round 2018 and went to Amritapuri regionals
- In NPTEL Massive open online courses, secured: **AIR 1** in Computer Architecture (IIT Kharagpur), **AIR 3** in Discrete Structures (IIT Ropar) and **AIR 7** in Algorithms course (IIT Kharagpur)
- **Regional 100%ile** in CoCubes and national 99.9%ile in Computer programming and Quantitative Ability in AMCAT employability assessments

Intern Experience

Indian Institute of Technology Kharagpur *Research Intern*
Mentor: Prof. Indranil Sengupta *Jun - Jul 2018*

- Secured e-Voting using Blockchain Technology: Developed and implemented a blockchain-based solution for securely digitizing the voting process
- The votes published in the blockchain were observable by everyone resulting in a tamper-proof ballot system

MBM Engineering College, Jodhpur *Robotics and IoT Internship*
Mentor: Prof. Alok Singh Gahlot *Jun - Jul 2017*

- Mentored around 200 students in a 2 month robotics workshop conducted by Embedded Systems and Robotics Club
- Worked on various robotics and IoT projects such as quadcopter, self balancing bot, PID, home automation, etc.

Publication

- **Best Paper** and **Young researcher** awards for paper "Towards Developing a Secure and Robust Solution for E-Voting using Blockchain" In: 2019 International Conference on Nascent Technologies in Engineering, IEEE

Thesis Project and Seminar

Semi-supervised methods of abnormality detection in medical images *M.Tech Project*
Mentor: Prof. Suyash Awate & Sunita Sarawagi *Jul 2020 - Present*

- Exploring and improving the semi-supervised methods of abnormality detection in medical images
- Working on weakly and semi-supervised learning of a DCNs for semantic image segmentation in medical images
- Evaluating the proposed methods on all existing baselines for few-shot and semi-supervised settings

High level supervision for medical images *Seminar*
Mentor: Prof. Sunita Sarawagi & Suyash Awate *Jan - Jul 2020*

- Literature survey on existing approaches of automatic generation of medical imaging reports
- Read about currently existing work on Scene graphs and Visual feature extraction, Real-time object detection and GAN-based synthetic brain MR Image generation
- Surveyed some few-shot supervision techniques in general and medical image domain

QR Code Protocols for Offline File Transfer *B.Tech Project*
Mentor: Prof. Abhisek Gour *Jun - Jul 2019*

- Created an Android app to transfer small images by scanning dynamically generated gif of QR images at 24 FPS
- Designed our own protocols for image sharing using QR images such as adding a header to QR frames

Brain Computer Interface *Seminar*
Mentor: Prof. Alok Singh Gahlot *Jan - Jul 2018*

- Studied working of BCIs and recent works on human and animal BCIs
- Surveyed a variety of case studies such as monkey operated robotic arm and brain to brain communication

Position of Responsibility

CSE Department Placement Coordinator *Jul 2020 - Present*

- Created/Curated 11 Coding tests on HackerRank and CodeChef for the final year batch to help them in placements
- Organized multiple sessions to resolve queries regarding programming or placement activities

Student Companion - Institute Student Companion Program (ISCP) *Jul 2020 - Present*

- Mentoring 8 students throughout the year helping them on academic and non-academic fronts

Administration Secretary - Innovation & Programming Club *Aug 2018 - Jul 2019*

- Encouraged peer tutoring, mentored students and took classes of C/C++/Python and Competitive programming

Teaching Assistantship *July 2019 - Present*

- **CS 215:** Data Analysis and Interpretation under Prof. Ajit Rajwade & Suyash Awate in Autumn semester, 2020
- **CS 218:** Design and Analysis of Algorithms under Prof. Nutan Limaye in Spring semester, 2020
- **CS 101:** Computer Programming & Utilization under Prof. Purushottam Kulkarni in Autumn semester, 2019
- **CS 736:** Algorithms for Medical Image Processing under Prof. Suyash Awate in Spring semester, 2021

Academic Projects

Automatic CTR Ratio calculation using CXR Images *Prof. Suyash Awate, Spring 2020*

- Segmented chest X-ray images to calculate cardiothoracic ratio and detecting cardiomegaly
- Used UNet architecture for segmentation and shape analysis, geometry and slopes for other heart parameters
- Achieved **79.4% acceptance rate** in practical settings which is **2.90% better than** the existing SOTA method

Intelligent test Interface with Plagiarism detection *Prof. Kavi Arya, Autumn 2019*

- Designed and implemented efficient algorithm for plagiarism detection between each pair of submitted responses
- Implemented LCS, Levenshtein distance and Shingle (N-gram) based algorithms such as Q-gram, cosine similarity and Jaccard index, also designed our own word-based Jaccard algorithm which showed better results

Pneumonia Chest X-ray Image Classifier *Prof. Sunita Sarawagi, Autumn 2019*

- Designed a neural network based binary classifier which detects pneumonia from chest x-ray images
- Analyzed the effect of kernel size, layers, dilation rate, pooling, size of image on accuracy
- Achieved an **accuracy of 91.185 %** using ensembling best performing model 6 times to generate predictions

Spatio-Temporal Indexing *Prof. S. Sudarshan, Autumn 2019*

- Created a spatio-temporal index on geographic data such as points or regions with an extra valid-time dimension
- Used Postgres spatial datatypes and the existing R-tree implementation in PostgreSQL underneath with certain modification, by adding specific `valid_from` and `valid_till` fields

Multi-snake game using Multi Agent Reinforcement Learning *Prof. Shivaram K., Autumn 2019*

- Formulated the two-snake version of the classic snake game as a Markov zero-sum game
- Trained each snake using minimax Deep Q-Network in a multi agent reinforcement learning setting

Logistics & Home Delivery Support System *Prof. Abhisek Gour, Autumn 2018*

- Worked on the Software Engineering aspect of the project which was to ease the logistics & Home delivery system
- Built the detailed SRS report, Use Case models, State (Flow) charts, activity, sequence and data flow diagrams and performed the cost analysis using COCOMO Estimation Model for this project

Technical Skills

Programming Languages & Tools	C, C++, Python, APL, MATLAB, Git, LaTeX
Limited Exposure	Java, R, HTML, CSS, Bash, Django, cmake, PostgreSQL, OpenGL

Extra curricular

- Selected for and attended **Google Research India AI Summer School**, August 2020
- **Won** the Line Seguidor Event in Ignus 2017 at IIT Jodhpur and went to finals at Techfest 2017, IIT Bombay
- **Won** the technical cover creator, face painting and quilling events in Ignus 2016-19 conducted by IIT Jodhpur
- Secured **1st position** in Code Alpha and **3rd position** in Obfuscator coding events at Ignus 2017, IIT Jodhpur
- Represented CSE in PG General Championship Chess tournament
- Solved Rubik's cube in 55.32 secs and was 7th in Ignus open, World Cube Association 2016
- Member of Theatre club (Pratibimb) for one year and took part in various street(Nukkad) and theatre plays

Hobbies

Competitive Programming, Badminton, Chess, Table Tennis