

# ADITYA JAIN

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## EDUCATION

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### Indian Institute of Technology Delhi

Undergraduate in Department of Computer Science and Engineering

### Aklank Public School

All India Senior Secondary Certificate Examination

July 2016 - July 2020

Overall GPA: 8.58/10

April 2014 - March 2016

Score : 93.00%

## ACADEMIC ACHIEVEMENTS

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**IIT Joint Entrance Examination (JEE) Advanced 2016:** Secured All India Rank **96**

**KVPY Fellowship 2016:** Secured All India Rank **126** and awarded scholarship by Indian Institute of Science, Bangalore

**National Standard Examination in Physics 2015:** among the **top 1%** of 44,032 participants from all over India

**National Standard Examination in Chemistry 2015:** among the **top 1%** of 39,671 participants from all over India

## INTERNSHIP EXPERIENCE

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### Samsung AI Center Seoul, South Korea

Guide: Dr. Jungmin Lee

May 2019 - July 2019

- Worked as part of the AI Core Team on an outfit grader using images of the items as input for recommendation system
- Designed a neural network architecture with Bi-LSTMs as baseline and attention beating the state of the art performance
- Solved the existing problem of low recall by using LDAM loss function along with various sample generation techniques

### TU Delft, The Netherlands

Guide: Prof. Alberto Bacchelli [github repo](#)

May 2018 - July 2018

- Developed a chrome extension enabling better test code review practices through its altered viewing system in Github
- Integrated code navigation in Github using Language Server Protocol and Eclipse Java Language Server for JAVA files
- Provided code coverage information using a third party API showing total coverage and lines covered in test code

## PROJECTS

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### Tejas-CNN: A CNN Accelerator Simulator

Bachelor's Thesis Project

July 2019 - July 2020

Supervisor: Prof. S. R. Sarangi

- Built first of its kind simulator for analyzing & exploration of **Systolic** & **SIMD** based CNN Accelerators' architecture
- Developed it as a modular JAVA software capable of handling different types of **dataflows** on the input architecture
- Simulated by doing **real computation** to explore better optimization techniques and providing **cycle accurate timing**

### Face Detection and Recognition for MAVI (Mobility Assistant For Visually Impaired) July 2019 - Jan 2020

Independent Project [github repo](#)

Supervisor: Prof. Chetan Arora

- Implemented **RetinaFace** in tensorflow taking shallower layers for detecting **tiny faces** and **FaceNet** for face recognition
- Used Intel's OpenVino to port the tensorflow models on **Intel Movidius 2** with Raspberry pi to compute on the edge

### Photon Mapping and Scene Rendering Using OpenGL

Course Project: Computer Graphics [photon\\_mapping opengl](#)

January 2020 - July 2020

Supervisor: Prof. Subodh Kumar

- Implemented a **distributed** recursive ray tracer using **Blinn/Phong** illumination model from ground up in C++
- Provided the effects of **caustics** and **global illumination** using Photon Mapping and support for mesh objects
- Created a sphere mesh and rendered a scene using OpenGL pipeline writing custom **vertex** and **fragment shader** for it

## Parallel and Distributed Computing

January 2019 - April 2019

Course Project: *Intro. to Parallel & Distributed Computing* [github repo](#)

Prof. Subodh Sharma

- Used Pthread, OpenMP, CUDA for GPU and Message Passing Interface (MPI standard) for implementing parallel/distributed versions of K Nearest Neighbours, Principal Component Analysis, Jacobis algorithm and Singular Matrix Decomposition and analyzed the results by varying parameters such as number of threads, cores etc.

## Software Package for Engineering Drawing

January 2018 - April 2018

Course Project: *Design Practices* [github repo](#)

Prof. Subhashis Banerjee

- Developed a C++ package for 3D modeling and conversions of given a orthographic image to isometric and vice versa
- Designed the functional specification , mathematical model and **UML** diagrams for better understanding and practice

## Virtualization and Signal Handling in xv6

February 2019 - April 2019

Course Project: *Operating Systems* [github repo](#)

Prof. S. R. Sarangi

- Added virtualization in xv6 OS using **containers** by creating their own fair virtual scheduler and independent file system
- Implemented **Maekawa's** mutual exclusion algorithm in both linux and xv6 by building signal handling in xv6 kernel
- Added inter process communication with multicast and used it along with barriers to develop parallel version of programs

## Liver Segmentation from abdominal CT Scans

February 2019 - March 2019

Course Project: *Advanced Computer Vision* [github repo](#)

Prof. Chetan Arora

- Designed a U-Net based convolutional neural network for the segmentation of liver from abdominal CT scan images
- Used deep learning techniques such as Dilated Convolutions and Inception Modules to further improve the performance

## Multicycle ARM based Processor and Reversi game in VHDL

January 2018 - April 2018

Course Project: *Computer Architecture* [github repo](#)

Prof. Anshul Kumar

- Wrote a processor for ARM instructions with various components such as memory, shifter, alu, register file etc.
- Implemented the game of Reversi in both JAVA and assembly language with simulation on ARMSim

## AI Player for Yinsh

August 2018 - September 2018

Course Project: *Principles of Artificial Intelligence* [github repo](#)

Prof. Mausam

- Created an AI player for the adversarial strategy board game Yinsh using **Alpha Beta Minimax** search algorithm
- Designed different heuristic functions & strategies for the game along with optimizations such as dynamic depth cutoff
- Implemented **Monte Carlo tree search** and **transposition tables** to increase ply searched in the allotted time

## TECHNICAL STRENGTHS

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<b>Computer Languages</b>	C/C++, Java, Python, OCaml, Prolog, VHDL, Javascript, Bash, Typescript, HTML
<b>Software &amp; Tools</b>	Xilinx ISE & Vivado, Android Studio, Tensorflow, CUDA, OpenMP, OpenGL, OpenCV

## RELEVANT COURSES

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Intro. To Computer Science, Calculus, Linear Algebra & Differential Equations, Data Structures And Algorithms, Discrete Mathematical Structures, Digital Logic & System Design, Probability & Stochastic Pro., Computer Architecture, Programming Languages, Design Practices, Principles of Artificial Intelligence, Machine Learning, Computer Networks, Analysis and Design of Algorithms, Operating Systems, Intro. to Parallel & Distributed Programming, Advance Computer Vision, Theory of Computation, Computer Graphics, Learning/AI for Cognitive Robot Intelligence, Advanced Distributed Systems, Applied Game Theory

## EXTRA-CIRRICULAR

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Volunteer for **AROHAN** program : taught electromagnetism to underprivileged students preparing for JEE 2018  
**Academic Mentor** (Aug,2017-April,2018) : Provided help to first year students facing problem in the course of APL100  
Secured 54th position in **ACM ICPC 2017** Asia Gwalior First Round with a team of three members