

# ALI HASSAAN MUGHAL

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## EDUCATION

National University of Sciences & Technology, H12, Islamabad.

Sep 2016 - Sep 2020

CGPA: 3.84/4 — Major GPA: 3.88/4

EECS CGPA Statistics<sup>1</sup> —  $\mu$  : 3.23.  $\sigma$  : 0.33

Department of Computer Science

Class Rank: 5 / 115

## TECHNICAL STRENGTHS

Languages/Frameworks	Java, Php, JavaScript, Laravel, Matlab, Python, C, C++, C#, Socket-Programming, Multi-Threading, Android, Maven, Hibernate & Spring.
Softwares/Tools	TensorFlow, CV, Scipy, PyTorch, Pandas, Wireshark, MySQL, LaTeX Selenium, Wordpress, Shell & Excel.

## EXPERIENCE

**TUKL R&D Lab, NUST, Islamabad**

Jun 2018 - Sep 2018

*Undergraduate Research/Development Intern*

*Deep Reinforcement Learning*

We worked on deep reinforcement learning for auto maneuverability of drones, to locate the objects in the environment using deep reinforcement learning to take decisions of next movement of the drone. During this time, I read several research papers on deep reinforcement learning and have taken online courses. I also implemented a part of ([Wenhan et al., 2017](#)) and some games using deep reinforcement learning using TensorFlow library as well.

**LibreHealthEHR, Open Source Contribution**

Feb 2018 - May 2018

*Development Contributor*

*Web Development*

I understood the code, identified and solved some issues of the [LibreHealthEHR](#) web module.

**TUKL R&D Lab, NUST, Islamabad**

Dec 2017 - Feb 2018

*Undergraduate Research/Development Intern*

*Deep Learning*

We worked on an automated document information extractor from the document tables using deep learning. We improved tesseract manually by different analytical techniques to extract data from various types of tables and reconstructed the data into rows & columns. The biggest problem we faced was to reconstruct the data into related rows & columns. The solution we implemented was inspired by ([Azka et al., 2017](#)).

**Freelancer**

Dec 2017 - Present

*Remote Work*

*Scripting & Development*

I work in C, C++, C#, Java, Python, Matlab, HTML, CSS, JavaScript, Laravel and SQL.

**Ausomatic, CIE, NUST, Islamabad**

Jul 2017 - Aug 2017

*Development Intern*

*Web Development*

I worked in a team of 4 people and updated the existing university management system. I understood the code base of the application, created new modules and reused the application for other universities.

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<sup>1</sup> Based on publicly available data of 705 currently enrolled EE and CS students in NUST with a CGPA of at-least 2.7. Actual mean would be lower.

I worked on the development of a point of sale system in a team of 3 people. I developed the database design using ERD and ORM in Laravel models, implemented the Laravel controllers and multi-level authentication.

## PROJECTS

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### HTTP Downloader

Computer Networks

I developed HTTP downloader from scratch using TCP sockets and multi-threaded multi-connections for better network usage. I also implemented the resume functionality for partially downloaded files.

**Tools Used:** Python, Sockets & Threading.

### FruitTeller Classification TensorFlow on Android

Advanced Programming

I collected images of fruits and not fruits and trained a TensorFlow model on it with an accuracy of 88%. Then, I deployed the trained model on android device using TensorFlow lite and android studio.

**Tools Used:** Python, Android (Java), TensorFlow & TensorBoard.

### Sahulat[Top Rank]

Web Engineering

Database Systems

I developed a web application to be used by services providers and customers. I added the functionality for customers to choose best-rated service providers and developed the architecture in extensible and reusable way. I implemented three roles for users; customers, admins, and service providers.

**Tools Used:** Laravel, HTML, CSS, JavaScript, JQuery & MySQL.

### Search Engine[Top Rank]

Data structures and Algorithms

I parsed a huge corpus of XML files of old Wikipedia pages. I did both forward and reverse indexing and calculated the page-rank on the using SEO techniques inspired by ([Sergey and Lawrence, 1998](#)). It could search both single and multi-word searching with complexities in  $O(1)$  and  $O(N \ln N)$ , where  $N$  is the number of pages containing the word. I used multiple PCs for processing the XML data.

**Tools Used:** Java, XML-parser, Arraylists, Hash-Sets & Hash-Maps.

### IoT Web Application

Computer Organization and Assembly Language

We (team of 2) worked on a web-based application for controlling an automated irrigation system for the plants. It used the dripping water technique in which, it uses the values from moisture sensors to water the crops based on flexible criterion of moisture.

**Tools Used:** Arduino IDE, ESP 8086, Moisture Sensors & Water Pump.

### Shipping Optimization System

Object Oriented Programming

I developed a system which calculated the fastest time delivery for shipping an item. It searches all the possible locations to process the customer orders. It selects the locations at nearest distances with the availability of all the required items to reduce the time of order, and speed up the shipping process.

**Tools Used:** Object Oriented Programming in Java, JSON Parser & Google Maps API's.

### PPM Editor & RSA Algorithm [Top Rank]

Fundamentals of Programming

I implemented console based application which edited the PPM files in C. I also implemented RSA algorithm in C++. It used the prime numbers to encrypt and decrypt the data.

**Tools Used:** C, GCC, C++ & G++.

## POSITION OF RESPONSIBILITY

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### Director Web & It

*FICS 2019*

Nov 2018 - Present

*NUST Islamabad*

Finding Innovative & Creative Solutions for Society ([FICS](#)) is an event where people contest for their solutions using technology. I am leading a team responsible for providing all type of Web & IT related services in the event. I have recruited the team. We are improving the judge participants application, managing the security of the system and working to provide a platform for the participants to help them in the event.

### Teaching Assistant

*Data Structures & Algorithms*

Sep 2018 - Jan 2019

*NUST Islamabad*

I graded the quizzes, assignments, maintained the records and provided assistance to the students in projects and learning for [Dr. Qaiser Riaz](#).

### Executive Web & It

*FICS 2018*

Jan 2018 - May 2018

*NUST Islamabad*

I created a web application for judges to judge the participants. It included security measures, to protect the data of judges and participants.

### Teaching Assistant

*Fundamentals of Computer Programming*

Sep 2017 - Jan 2018

*NUST Islamabad*

I performed the task of grading the quizzes, assignments and guided students in learning programming and in their projects for [Ms. Sana Khalique](#).

## ACHIEVEMENTS

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Consecutive 4 times part of Dean's list of high achievers and awarded scholarship.

Winner of Speed Programming competition held by ACM, NUST.

1st rank in Pakistan in Morgan Stanley Campus Codeathon 2017.

2nd rank in Pakistan in University Code Sprint 3.

3rd rank in Speed Programming competition in my class.

## ADDITIONAL COURSES

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Cisco Networking Specialization

Deep Learning

Data Science

Deep Reinforcement Learning

Machine Learning

Learning How to Learn

## EXTRA-CURRICULAR

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I teach computer science to children.

I go to gymnasium 5 days a week.

I go hiking once in a month.