



# MD Analysis Project - Benchmarking and performance optimization

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**Ajay Singh Chauhan**

Govind Ballabh Pant Institute of Engineering and Technology, Pauri  
Uttarakhand, India (246194)

# Introduction

Name: Ajay Singh Chauhan

University: Govind Ballabh Pant Institute of Engineering and Technology, Pauri, UK, India

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Phone number: +91 6398085979

Github: <https://github.com/ajaychauhan4310>

Linkedin: <https://www.linkedin.com/in/ajaychauhan4310>

Location: Pauri, Uttarakhand, India

Timezone: IST ( UTC + 5:30 )

I have been into programming for more than 4 years now. My main area of expertise is application development. I build products right from the inception phase. I am a strong believer of *The Zen Of Python* and thus writing *clean and beautiful* code is second nature to me.

Open source has been a relatively new realm for me but I make YouTube videos and write tech blogs to help fellow developers understand good coding practices and tricky concepts.

## ALL ABOUT ME

It all starts from 3<sup>rd</sup> standard when my parent sent me to learn how to operate computer and basic application like Ms Office before buying computer. When I am in 4<sup>th</sup> standard my parents bought a PCs after that learn lot of things like how to install windows XP and 7 and what is the importance of Driver software's, BIOS etc. As my Parents see that I have interest in computer related things, when I am In 6<sup>th</sup> class my parents sent me R.C.T.I Institute where lot of thing like Photoshop, tally, I also learn C++ programming language and from there I have interest in programming then I learn HTML, XML, CSS, Python. When I am in 8<sup>th</sup> class I learn about hacking like Kali Linux OS, phishing, Wi-Fi attack, password cracking windows 7 and zip, rar file cracking, when I am in 8<sup>th</sup> class I hack my school Wi-Fi password, after that I crack my area shop cyber café password, my Bansal classes coaching institute Wi-Fi password, Golden fish Canteen Wi-Fi etc. after that when I am in 11<sup>th</sup> standard I choose PCM with Computer Science. After 12<sup>th</sup>, I drop for JEE exam in this duration I learn about ADB(Android Debug Bridge) I crack JEE mains 2020 but I am not able to clear JEE advance 2020, In JEE mains basis I got a Good Govt. college named Govind Ballabh Pant Institute of Engineering and Technolgy where I learn C, C++ language, python language, AutoCAD etc side by side I am doing Kotlin (android app development), I also did Automatic real world task in python by Google, I also made hand reorganization system in python, I also IBM Authorized course of 30 weeks, now I am in 2<sup>nd</sup> year and doing Artificial intelligence courses



# AJAY SINGH CHAUHAN

Computer Science Engineering with Artificial Intelligence and Machine Learning

**Nationality:** INDIA

**DOB:** 12/01/2002(dd/mm/yyyy)

**Gender:** Male

**G.B.P.I.E.T**

## Resume Objective

To work in a stimulating and challenging milieu that would facilitate the maximum utilization and application of my broad skills and expertise in making a positive difference to the organization, looking to leverage my knowledge and experience.

## CONTACT

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☎: +91 6398085979

📍: Nain Pavis Colony, Simmal Chaur, P.O Padampur sukhrow, Kotdwara, Dist. Pauri Garhwal, Uttarakhand (246149)

## KEY SKILL

Python 3



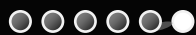
Cybersecurity



C++ Language



JAVA Language



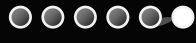
C Language



Typing Speed

Of 54WPM

HTML Language



## EXPERIENCE

- ✓ Computer Application Handling of 6 month with certificate from R.C.T.I
- ✓ Involved in Computer related thing from 6<sup>th</sup> class (7 years inbuilt Experience)

## Qualifications

- ✓ **IBM Cybersecurity Analyst [30 Weeks]** – [2022-2023] **By IBM with Certificate**
- ✓ **Automating Real-World Task with Python** **By Google with Certificate**
- ✓ **1 MONTH MASTER CLASSED ON Artificial** – [2021-2022] **By Pantech with Certificate**
- ✓ **B. TECH (CSE (AI & ML))** **G.B.P.I.E.T, Pauri Garhwal**  
Graduation in B.Tech Computer Science and Engineering with Artificial Intelligence and Machine learning 2<sup>nd</sup> year completed with 8.6/10 CGPA
- ✓ **B.TECH (CSE (AI & ML))** – [2020-2021] **G.B.P.I.E.T, Pauri Garhwal**  
Graduation in B.Tech Computer Science and Engineering with Artificial Intelligence and Machine learning 1<sup>st</sup> year completed with 8.7/10 CGPA
- ✓ **INTERMEDIATE** – [2018-2019] **T.C.G Public School, Kotdwara**  
12<sup>th</sup> passed (PCM with CS) from CBSE Board with 78%.
- ✓ **DIPLOMA IN COMPUTER APPLICATION** – [2017-2018] **R.C.T.I, Kotdwara**  
Computer Application with Certificate (94.44%)
- ✓ **HIGH SCHOOL** – [2016-2017] **T.C.G Public School, Kotdwara**  
10<sup>th</sup> passed from CBSE Board with 9.6/10 CGPA

## Additional Skills

- ✓ Programming languages : C, C++, Python 3, JAVA, HTML, DBMS etc
- ✓ Operating system: Windows, Ubuntu
- ✓ Android Studio ( Kotlin)
- ✓ Video Editing (Adobe Premiere Pro)
- ✓ Photoshop, Microsoft office

## SOCIAL MEDIA



ajaychauhan4310

9/10

Project Managing & Handling

8/10

Communication



8 Courses

**Introduction to  
Cybersecurity Tools & Cyber  
Attacks**

**Cybersecurity Roles,  
Processes & Operating  
System Security**

**Cybersecurity Compliance  
Framework & System  
Administration**

**Network Security &  
Database Vulnerabilities**

**Penetration Testing,  
Incident Response and  
Forensics**

**Cyber Threat Intelligence**

**Cybersecurity Capstone:  
Breach Response Case  
Studies**

**IBM Cybersecurity Analyst  
Assessment**



Apr 16, 2022

## AJAY SINGH CHAUHAN

has successfully completed the online, non-credit Professional Certificate

# IBM Cybersecurity Analyst

In this Professional Certificate, learners developed and honed essential knowledge and skills to enter today's dynamic cybersecurity workforce. Learners developed knowledge of cybersecurity analyst tools including data protection; endpoint protection; SIEM; and systems and network fundamentals; acquired knowledge around key compliance and threat intelligence topics important in today's cybersecurity landscape; gained skills for incident responses and forensics. The learner's knowledge and skills were tested through multiple assessments throughout the courses, a real-world breach case study and several hands on virtual labs. The learner also achieved a passing score on a final assessment course covering all content from the previous seven courses.

*Green Kishamp*

Program Manager, IBM  
Security Learning  
Services

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

Verify this certificate at:

<https://coursera.org/verify/professional-cert/898JYW7W9FZH>



Jan 30, 2022

**AJAY SINGH CHAUHAN**

has successfully completed

**Automating Real-World Tasks with Python**

an online non-credit course authorized by Google and offered through Coursera

**Google**

Google

**COURSE  
CERTIFICATE**



Verify at:  
[coursera.org/verify/XX5UD4LCQLCH](https://coursera.org/verify/XX5UD4LCQLCH)

Coursera has confirmed the identity of this individual and their participation in the course.

Certificate No PS-APSSDC-AIMC-0263



# CERTIFICATE OF PARTICIPATION

NAME Mr.AJAY SINGH CHAUHAN  
COLLEGE GOVIND BALLABH PANT INSTITUTE OF ENGINEERING AND TECHNOLOG

has Successfully Completed  
30 Days Master Class on Artificial Intelligence

at Pantech e Learning Pvt Ltd, Chennai

From 6.12.2021 To 4.1.2022

M.Malaiappan  
Director  
Pantech e Learning

Dr. Ravi Gujjala  
Chief General Manager (Technical)  
APSSDC

Prof. Rama Koti Reddy  
Executive Director  
APSSDC

N Bangara Raju  
Managing Director  
APSSDC

## Proposal

Benchmarking and performance optimization: The current Md Analysis project need python skill, I done some python work like automatic task in real world in python. We also have a lot of broken features which need to be fixed in the existing platform. To make the matters worse, we don't have alot of developer support for security when compared to other web projects.

I plan to shift the platform to a more modern and reliable framework. Being a python powered library specially designed to create automatic task like mediapipe, numpy, tensorflow, ASV (airspeed velocity) etc using python library happens to be the right choice for the job. While shifting, we will re-implement the existing

## Deliverable

I plan to cover the following during my GSOC project work:

- **Reimplement the following major components**
  - Experiment section ( Further sub-components )
  - Control panel
  - Advanced control panel ( Further sub-components )
  - Help section ( Redesign this section for making the system service more usable for amateurs )
- **Redesign and implement a modern dashboard**
  - I will make use of Ux design in UI standards to design an easy to understand.
  - Implement a theming system for two primary themes - Dark / White ( Low priority )
- **Recategorize the system and it's sections in a more logical fashion**
  - Each of the proposed categorization get a seperate tab in the side nav bar for easier access and navigation.
- **Bridge to the device**
  - The communication bridge between the systems and this will be done using the Lab-python library
  - Make use of the python-shell module and write necessary scripts for making use of different device features
  - Do a thorough testing of the scripts using a physical hardware after the bridge has been finished
- **Add new tools in the existing tool**
- **Create a universal installer**
  - Make use of the ASV build system to create a final
- **Write a thorough and easy to use documentation**

This will cover all the major tools, their available settings

# Timeline

<b>Community Bonding Period</b>	<ul style="list-style-type: none"><li>• Discussion with my mentor.</li></ul>
<b>Week 1</b>	<ul style="list-style-type: none"><li>• Finalize chain collection that we will re-implement.</li><li>• Do a thorough analysis of data format</li></ul>
<b>Week 2</b>	<ul style="list-style-type: none"><li>• Start Writing python scripts that will be called via python shell</li><li>• Work on the bridge in python library</li></ul>
<b>Week 3</b>	<ul style="list-style-type: none"><li>• Run full set of testing</li></ul>
<b>Week 4, 5</b>	<ul style="list-style-type: none"><li>• Start working on Controls component.</li><li>• Start working on Advance controls components (asv library)</li></ul>
<b>Week 6</b>	<ul style="list-style-type: none"><li>• Implementing Logics</li><li>• Test and improve the system service</li><li>• Discuss about the project, topics</li></ul>
<b>Week --</b>	--
--	-- so on..



## Post GSoC and Future work

After deployment of the fully functional service system, I would take up the responsibility of maintaining the project even after my GSoC period. I would make sure that further contributions to the code base follow strict coding standards and adhere to MD analysis contribution guidelines. I would also make sure that the product coheres to leading industry standards by making sure that the libraries stay up to date and guide my fellow developers to make changes to the code base accordingly.

I would also encourage my juniors and batch mates to contribute to MD Analysis projects and conduct events to spread awareness regarding the importance of Open Source Software in the current software ecosystem.

## Obligations / Schedule conflicts

I have No Obligations in summer and will be able to contribute full time to GSoC. I will be able to devote 7 – 10 hours daily making a sum total of 50 hours in a week on an average. I will be moving to kotdwara in the first week of July and that would become a blocker for me for a few weeks so I'll be down to 4 – 5 hours a day but I will be able to compensate for that as I have made my weekly goals accordingly and I can guarantee that I'll be able to deliver what I have claimed in my work plan breakup. After 3rd week of July I'll be able to deliver 8 – 10 hours on a daily basis again till the end of the GSoC period.

## Outreach

I will submit a weekly technical blog article, share it on social media, provide three webcasts, two presentations and organize a small outreach meetup each month

## Why Benchmarking and performance optimization?

The current Md Analysis project need python skill, I done some python work like automatic task in real world in python. As the MD Analysis has a scope for renovation, It also help the all networks. I would love to be the members of the same. There would be nothing more honorable for me as an open source developer than to be a part of such a promising project.

## Why MD Analysis?

MD Analysis stands out of the crowd due to its wide range of projects. The organization happens to be a very mature ground for open source contributors to try their skills out at the same time be a part of a wonderful and supportive community of developers. I have worked on several python projects so far but the MD analysis project gave me an insight on how to work on large scale open source projects where the project is being maintained by a large group of people. It also gave me an understanding of how to propose ideas and optimizations and move it up the chain of commands before actually putting them in production. I am also very much interested in optimization field.