# Adeel Ahmad

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## Open-source projects

Trip Planner [Python]

Wrote a CLI tool for filtering Google Maps places based on an input query and exported them to a CSV file (*featured* on Hacker News.)

GeoLib [C++, Boost]

Used C++ template specialization to implement a generalized version of distance computation algorithms.

Edge detectors [Python]

Implemented commonly used image edge detection algorithms, including Canny edge and Marr Hildreth.

Particle Swarm Optimization [C++, mlpack]

Implemented the PSO algorithm for constrained optimization problems in the mlpack library using template metaprogramming.

## Education

National University of Computer and Emerging Sciences
2014-2018 *Islamabad, Pakistan*
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Thesis: "Analysis of Structure from Motion Techniques"

## Toolsets

Linux:

Arch, Systemd, Collectd, Bash, sed

Programming languages:

C++, Python, Go, JavaScript, LaTeX

Computer vision / machine learning:

OpenCV, TensorFlow, NumPy

Cloud management / web development:

Puppet, Travis CI, AWS, Django, MySQL, PostgreSQL

## Interests

Kayaking, Skiing, Traveling

## Work experience

**Technical Student in Computer Security** September 2018 - October 2019
European Organization for Nuclear Research (CERN) *Geneva, Switzerland*
(*Team size: 9*)

Initiated a project on cloud automation using Puppet and streamlined the build process of RPM packages. Deployed a highly-concurrent tool for monitoring anomalous SSH login activity. Gathered feedback from section leader to improve the usability of a web application system.

**Software Developer Intern** May 2018 - August 2018
Google Summer of Code 2018 (Boost C++ Libraries)

Reduced the error of a distance algorithm for antipodal points to $10^{-6*}$ and benchmarked the performance metrics against existing algorithms. The inaccuracy is mostly encountered in flight planning systems.

**Software Developer Intern** May 2017 - August 2017
Google Summer of Code 2017 (Open Astronomy)

Developed a Python package to visualize astronomical images. Reduced the fetch latency by 75%* using asynchronous programming techniques.

## Coursework projects

Concurrent & Distributed Systems — April 2018

Implemented a distributed searching algorithm using Golang and balanced the workload equally among available processes to achieve consensus.

Deep Learning — January 2018

Analyzed plant imagery using a convolutional neural network to perform classification of plant species.

Digital Image Processing — December 2016

Performed template matching using Generalized Hough transform for finding the encircled MCQ's in an exam sheet.

## Events and conferences

Thematic CERN School of Computing — May 2019
An annual school based on the topic of high throughput distributed processing with lectures on vectorization, optimization, and effective I/O techniques for scientific applications. *Split, Croatia*

Insomni'Hack — March 2019
A security conference which involved talks on hardware and software level exploits and a capture-the-flag event. *Geneva, Switzerland*

Swiss Web Security Day — October 2018
A platform which brought together individuals from various technology sectors on the global topic of cyber security. *Bern, Switzerland*

## Volunteer work

CERN Open Days — September 2019
Scanned visitor badges for entrance to the CERN site and assisted visitors with a virtual reality headset activity.