

# NEEL GANDHI



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## EDUCATION

### Carnegie Mellon University (Aug 2018 - May 2022)

Bachelor of Science in Electrical and  
Computer Engineering  
Minors in Biomedical Engineering and  
Computer Science  
GPA: 3.9, Dean's List

#### Relevant Coursework (Upcoming\*)

15-410 Operating Systems  
15-418 Parallel Comp. Architecture  
15-462 Computer Graphics  
15-213 Computer Systems  
16-385 Computer Vision  
10-301 Machine Learning  
15-281 Artificial Intelligence  
15-210 Parallel/Sequential Algorithms  
18-240 Digital Systems Design  
42-688 Neural Engineering

## SKILLS

#### Programming Languages

Python, C, MATLAB, Java, SML, C++,  
Assembly, Mathematica, HTML/CSS/JS

#### Technologies

Google Cloud SDK, Robot Operating  
System, Android Studio/Flutter  
(Basic), Unity (Basic), AWS (basic),  
Flask

## HACKATHONS

**MHacks 2020** – Facebook "Best Hack Brings  
the World Closer Together"

**TartanHacks 2019** – Finalist and Facebook  
"Social Impact" award

**PennApps 2019** – Goldman Sachs award

**Hack This. Help Kids. 2018** – Finalist

**HackCMU 2018** – 2nd place for Bloomberg  
social good award

**SteelHacks 2019** – 4th place

## ACTIVITIES

**RoboClub** – Data collection for object  
detection models, trajectory, and  
electronics for Tartan  
Autonomous Underwater Vehicle  
team.

#### Business Technology Group –

Backend developer for club's first  
website, using AWS and flask.

**Science Olympiad** – Circuit Lab exam  
writer for CMU's tournament.

## EXPERIENCE

### Software Engineering Intern – Pytorch Distributed

Facebook, Inc. | Virtual Internship | May-Aug 2021

Introduced improvements to Pytorch's Distributed Elastic (TorchElastic) framework,  
contributing to both open-source and internal codebases in Python and C++.

- Implemented a primary address selection protocol to perform synchronization between distributed nodes, enabling direct replacement of a previous higher-overhead system used in thousands of machine learning jobs every day within the company.
- Added support for a file-based backend for synchronization of distributed nodes.
- Built internal logging dashboards to monitor use of the new synchronization mechanism.

### 15-210 Parallel Algorithms TA

Carnegie Mellon University | Pittsburgh, PA | Aug-Dec 2020

Teaching Assistant for Parallel and Sequential Data Structures and Algorithms.

- Lead recitations, hold office hours, and teach with SML (functional programming language)
- Topics include asymptotic analysis, probability theory, parallel algorithm design, graph theory, dynamic programming, hashing, and concurrency.

### Software Engineering Intern (STEP) – Google Shopping

Google LLC | Virtual Internship | May-Aug 2020

Developed a product cataloging platform to connect customers with local businesses impacted by COVID-19.

- Utilized Google Vision AI to create a seamless interface that automatically tags and classifies products from images uploaded by a business owner and allows customers to reverse image search for those products in the catalog (OCR, label and object detection, product image search).
- Full Stack development with Google Cloud App Engine, Google Cloud Datastore, Java Servlets, and HTML/CSS/JS.

### Undergraduate Researcher

Carnegie Mellon University | Pittsburgh, PA | Feb 2019-May 2020

Worked in the Biomedical Functional Imaging and Neuroengineering Lab researching on brain computer interfaces (BCI).

- Applied EEG to detect and utilize motor-related brain signals that could be used to control a robotic arm.
- Developed a MATLAB-based software to stream/process EEG data to perform BCI tasks.

## PROJECTS

### Operating System Kernel CS 15-410 Project

- Designed and implemented an OS kernel, thread library, device drivers, and hypervisor.
- Core components include scheduling, virtual memory, thread and process management, program loading, and paravirtualization.

### Graphics Software Package CS 15-462/15-418 Project

- Implemented core components of the Scotty3D graphics software, including interactive mesh editing, realistic path tracing, and dynamic animation, written in C++.
- Accelerated ray tracing with OpenCL GPU and OpenMP CPU programming.

### We Have A Car (Mini Autonomous Car) Build18 Hardware Hackathon 2020

- Utilized a ZED Mini camera, lidar, and Jetson Xavier to build a mini autonomous car that performs Simultaneous Localization and Mapping (SLAM) of an unknown environment.

### Hide.Me (Steganography Messaging) CS 15-112 Term Project

- Implemented various steganography algorithms to encode and encrypt secret data inside images, all within a messaging application created using python sockets.

### Lab.Me (AR Chemistry Lab) TartanHacks 2019 award winner

- Designed an augmented reality chemistry lab with Unity and Vuforia engine, aimed towards providing science lab education to the underprivileged.