

# DURGESH KUMAR

G44-Govind Bhawan, IIT Roorkee, U.K. 247667

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## EDUCATION

**Indian Institute of Technology Roorkee | *UK, India***

Bachelor's of Technology in Civil Engineering

*July 2017 - Present*

Overall GPA: 8.2/10

**Aligarh Muslim University | *UP, India***

Senior Secondary

*August 2015 - May 2017*

Overall Percentage: 87.2%

**Delhi Public School, Aligarh | *UP, India***

High School

*August 2013 - May 2015*

Overall GPA: 10/10

## SKILLS & INTERESTS

**Computer Languages**

C++, Python, Javascript, Dart, Assembly, HTML5, CSS

**Software Packages**

Flutter, Django, React, React-Native, Tensorflow, Jupyter, Git, MySQL, Bash, VS Code, Cloud Services.

**Additional Courses Taken**

Machine Learning (Stanford CS-229), Linear Algebra (MIT 18.06), Probability & Statistics (IITR MAN-006), Modern Physics (IITR PYN-007), Intro to Algorithms (MIT 6.006), Graph Theory (Nptel IISC)

**Language Known**

English (SRW), Hindi (SRW), Urdu (SRW), Japanese (RW)

## EXPERIENCE

**Web Developer | *Google Summer of Code | Remote***

27 May 2019 - 19 Aug 2019

- Worked as a Student Developer and shipped open-source software for ScoRe Lab under the Google Summer of Code program.
- We develop a Web Application that enables users to sketch a deep learning model by connecting various nodes in a drag & drop interface.
- The Frontend is written in Reactjs, along with the backend & database support provided by flask APIs and MySQL

**Junior Researcher | *Nakai's Lab | The University of Tokyo***

20 May 2019 - 10 July 2019

- Worked on the Cancerous and non-Cancerous cell determination along with the Promoter and Enhancer region prediction using interaction matrices generated by 3C technique.
- Proposed and implemented a method that merges the 3-dimensional structure and interaction matrix to create a weighted undirected graph. And then run it through the Graph Algorithms and Graph Neural Networks.
- I used python's networkx library for local implementation and sigma.js for its visualization in the browser with backend support written in Django.

**Undergraduate Researcher | *CBTB Lab | IIT Roorkee***

May 2018 - Aug 2018

- Brain signal analysis and filtering to predict the brain state along with the motive to categorize Alzheimer's disease.
- Implemented a brain wave filter using the Butterworths filter which detects the brain state.
- DNA sequence analysis using Fast Fourier Transformation (FFT) algorithm along with the implementation of Sequence Logos.

## PROJECTS

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### **A Mobile Application | *Dhadkan***

May 2019 - Present

IIT Roorkee & AIIMS Delhi | React-Native, Django | <https://github.com/orionpax00/dhadkan>

- Developed a cross platform react-native mobile App to assist doctor's to manage and track their patient.
- Scheduled Jobs, Real-time messaging, medicine and data reminder, OCR, push notification, are the key features.
- App was also used for collecting data from around 200 patient about their health status.

### **Dance Pose Generation | *Deep Learning***

Sep 2019 - Present

IIT Roorkee | Python, Tensorflow | <https://github.com/orionpax00/dancepose>

- Implemented various sequence to sequence generation models to generate human dance poses.
- Key idea was to generate a full dance moves sequence from the random noise input.
- Dataset from <http://mocap.cs.cmu.edu/> was used.

### **Weather Data Analysis & GHI/Wind Speed Forecast | *Weather***

May 2019 - Present

IIT Roorkee | Python, Scikit-learn, Tensorflow, XGBoost | <https://github.com/orionpax00/weather>

- Analysed weather data of Haridwar district of past 15 years, goal was the incoming solar radiation and wind direction forecast.
- Ensemble learning methods(Stacking) and attention based LSTM-CNN model were trained.

### **Land Survey | *AMRUT***

Nov 2018

IIT Roorkee | ArcGIS

- Surveyed Mohammadpur - Asafnagar region of Roorkee with an area of 2.37km<sup>2</sup> as per AMRUT guidelines attributed the area with over 1500 buildings and 35 roads.
- Developed a common digital Geo-referenced base map and land use maps using GIS.
- Carried out the Digitization of the area using the software Arc GIS and ERDAS IMAGINE.

### **Protein Structure Similarity Matching Algorithm | *PPI***

Sep 2018 - Oct 2018

IIT Roorkee | Python, Django | <https://github.com/orionpax00/ppi>

- Developed a Protein-Protein Interaction prediction algorithm, in which the key parts were the creation of input feature vectors for ML algorithm and time reduction of the overall model.
- Automated many processes, which utilize the power of numerous distinct software (such as Modeler, Kpax, MUSTER, and PSIPRED).
- Developed a web server that supports online querying and Job submission.

### **Medicinal Plants Database | *DISPEL***

Aug 2018

IIT Roorkee | Neo4j, Django, React, Vis.js | <https://github.com/orionpax00/dispel>

- Scraped and parsed a whole bunch of websites to enhance the existing medicinal plants and diseases database.
- Converted the data stored in excel files to the Neo4j graphical database.
- Designed and developed a fully working web portal which creates a network graph of plant and diseases cured by them and vice-versa according to the query.

### **More Generalized Poincare Algorithm | *POINCARE***

Aug 2018

IIT Roorkee & AIIMS Rishikesh | Python, Django | <https://github.com/orionpax00/poincare>

- Reverse engineered the existing Poincare algorithm and constructed a generic algorithm that helps in a better understanding of heart rate variability.
- The significant change was the multiplot function that creates the plots for a wide range of intervals.
- Bundled the program into a python command-line package.

## AWARDS / SCHOLARSHIPS / ACADEMIC ACHIEVEMENTS

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- GIS Fellowship (Internship Grant from UTokyo - 2,00,240 yen ).
- Google Summer of Code fellowship.
- Got Selected for SPARK IIT Roorkee.
- UP Science Talent Search Examination Scholarship.
- Merit Cum Means Scholarship IIT Roorkee.
- JEE Advanced Rank - 5632.

## POSITIONS OF RESPONSIBILITY & EXTRA CURRICULARS

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**Joint Secretary | HEC IIT Roorkee** 2018 - Present

- Manage design and database work of the Himalayan Explorers' Club.
- Coordinated conditioning for various Treks and on campus activities.

**Cardiovascular Research Convergence | AIIMS New Delhi** 13 - 14 Oct 2018

- Attended Cardiovascular Research Convergence at AIIMS New Delhi related to the new advancement in cardiovascular health care.

**NCC | 3UK CTR NCC IIT Roorkee** Aug 2017 - Apr 2018

- Dedicatedly worked as an NCC cadet.

**Workshop Coordinator | IIT Roorkee** 23 Mar 2018 - 24 Mar 2018

- Coordinated "Internet of Things Workshop" in cognizance-2018 organized by Finland labs.

## POSITIONS OF RESPONSIBILITY & EXTRA CURRICULARS

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