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About me : I am a junior year CS major. My prime interests lies in using programming as a tool in diverse streams, Astronomy being one of them. All my projects till now have been from different engineering and science streams. Few of them being :

1. Braille printer using arduino and Python (description in my Github)
2. File Upload and Data Analysis using **Flask** (description in my Github)
3. Android Apps on Play Store, one being utilized heavily in Energy Modelling of Buildings
4. Breast Cancer tumour **classification** applying Machine Learning Algorithms
5. Research Work in **Number Theory** (precisely in the field of Number Theoretic Functions)
6. Research Work in Data Mining (developing a novel **FP mining algorithm** using Closed Frequent Itemsets)
7. Research Work in **Graph Theory** (in field of sparse matrices and their exponent)
8. Facial Recognition using Signal Processing and Matlab
9. Various projects on Web Scraping , Twitter API, Telegram APIs (description in my Github)
10. Assisted my College **Hyperloop** team , for **SpaceX competition** in pod design and simulations.
11. Open Source contributions in Pandas and Sympy. With one API change integrated in latest version of Pandas (v18.0)  [Issue: 11833](https://github.com/pydata/pandas/issues/11833)

Few of these projects have utilized scientific data. For instance the android app I developed for energy/material modelling was completely based on thermodynamic datasets. It used EPF and U-value calculators to  design building structure in an eco-friendly and energy efficient manner. It has various widgets like sliders, dropdowns etc making it very user friendly and can be effectively used even by a layman.

The link to the app -: [ECBC scientific app](https://play.google.com/store/apps/details?id=ecbcapp.ecbc&hl=en). Another project which utilized scientific data was **Breast Cancer tumour Classification**. The dataset used was from UCI machine learning repository. Python’s Matplotlib library was used to plot the data and Pandas was used for data analysis .Numerous interactive graphs and sub plots, 3D plots etc were created showing tumour classification (malignant/benign) with various features like radius, colour, texture etc.They could have been of immense benefit for cancer scientists, who could analyse tumour trends just by looking at the interactive plots.These two projects have modelled complex scientific data into a presentable and interactive UI.This kind of work would be required in NanoGrav project, in which primary scientific and diagnostic data has to be plotted.Most of the  Maths/Data Mining  projects which I have done have all been research initiatives under distinguished professors.Thus I have prior research experience to contribute in a scientific research observatory.

Courses and Skills : Numerical Analysis, Abstract Algebra, Algorithms, Number Theory ,Linear Algebra, Calculus,Classical Mechanics, Electromagnetism, Python ,Flask, Rest APIs, Android,Machine Learning, Data Mining,Java,JavaScript,C and Git .

Project Chosen :

Gravitational Waves Pulsars and NANOGrav

Reason for Choosing :

I am a learning enthusiast, Astronomy/Astrophysics being one of my favourite disciples.

I grew up watching Walter Lewin lectures.  They got me  into Physics in general and Astrophysics in particular. Later fields like machine learning and guys like [Jake Vanderplas](http://staff.washington.edu/jakevdp/) motivated me enough to use programming as a tool in astronomy and natural sciences

Since this particular project involves less knowledge of Astronomy , this  makes it  more interesting. The learning curve is steep and the scope of learning  about celestial objects like Pulsars  makes it very captivating. Modern technologies like NANOGrav are involved in this project which are used to understand still mysterious gravitational waves . Thus the prospect of making a scientific discovery takes motivation to an altogether different dimension

I hope to gain decent astronomy/astrophysics knowledge while working on this project. Some knowledge  of web-data visualization for astronomical data would also be imbibed. I plan to gain overall research experience while spending my summers in McGill Space Institute.

The reason for choosing McGill Space Institute over others is that it is a **Research** Observatory working in astronomy/astrophysics. The work  would not be confined to mere coding and testing. It is the research and the personal mentorship that excites me.I plan to do MS in Computer Science after my undergrad.A research internship like this under close scrutiny of leading scientists would definitely aid my future plans for graduate studies.Collaborating with researchers on a personal basis would provide  first hand research experience. Working on scientific big data and designing user friendly interfaces would be an excellent programming  opportunity.

I would be very glad to come over to Montreal for the summers. The idea of having fun summers in a different nation definitely adds to my reasons for choosing McGill Space Institute

The link for the exercise :[dropbox link](https://www.dropbox.com/s/aprnbeosk4ov2mf/plot.html?dl=0)

You have to download the html file and open it in your local browser.