Dhananjhay Bansal

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SKILLS

Python, JavaScript, HTML, CSS, SQL, Gremlin, Windows, Linux, MySQL, JanusGraph, Amazon AWS, Django, Flask, TensorFlow, ReactJS, Git, MATLAB, REST API, Postman, Typescript, Docker

EDUCATION

University of Alberta, Edmonton AB — Aug. 2019 – June 2023

- Bachelor of Science with Honors in Astrophysics — GPA: 3.92/4.00

University of Toronto — May 3-13, 2022

- CTA200H - Introduction to Astrophysical Computing

WORK EXPERIENCE

Junior Astrophysicist & Full Stack Software Developer — May 2023 – Aug. 2023
National Research Council of Canada, Herzberg Astrophysics Research Centre

- Developed a full stack software to simulate exposure time calculation (ETC) for the upcoming first Canadian flagship telescope, CASTOR, available at https://github.com/CASTOR-telescope
- The software stack included React JS + Material UI for frontend and custom written Flask code for managing the API calls in the backend
- Updated the transit simulation python package for the upcoming POET mission and made it more efficient, available at https://github.com/jasonfrowe/poet

Full Stack Software Developer — May 2022 – Aug. 2022
University of Toronto & Canadian Institute for Theoretical Astrophysics

- Built a full-stack software responsible for managing the entire signal chain of components for next generation cosmology telescopes, available at https://github.com/radiocosmology/padloper
- The software stack included JanusGraph + Apache Cassandra + Elasticsearch for the backend, React JS + MUI for the frontend and custom written Flask API in python to connect the backend with the frontend
- Implemented indexing in JanusGraph database schemas to make the GUI faster and efficient as the signal chain components reached around 20,000

Data Analyst & Simulation Developer May 2021 – April 2023
University of Alberta

- Translated code from MATLAB to python to build various stimulation tools to determine dissipation induced by libration and precession in the fluid core of the TRAPPIST-1 planets, available at https://github.com/Dhananjhay/ResearchProjectCodeBase
- Analysed data from NASA exoplanets archive using Pandas, SciPy, NumPy and Matplotlib

PROJECTS

Co-Founder & Full Stack Software Developer
Social Media Application, available at www.unitedagainstcovid19.in

- Co-Founded a social media web application (currently discontinued) which allowed people to post and access information regarding the availability of resources like oxygen tanks, plasma, etcetera, during the second wave of coronavirus pandemic in India
- After 2 months, the website's database included 700 form submissions and we swiftly expanded our team to about twenty people to regulate new form submissions
- React JS was used to build the GUI and SQL and Django were used to create database schemas and API requests handler; the website was hosted on Amazon AWS server

Machine Learning Algorithm Developer
University of Alberta, available at https://github.com/Dhananjhay/Undergraduate-Thesis

- Build convolutional neural network models, specifically semantic segmentation models based on U-Net architecture, to identify stellar wind bubbles in galaxies
- Used TensorFlow and Keras platforms, along with python libraries: astropy, skimage libraries to train and test the model