ARITRA MUKHOPADHYAY

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ABOUT ME

I am a **Physics major** student (Int. MSc.) at the **National Institute of Science Education and Research** (NISER). Apart from Physics, I have a keen interest in **Robotics and Technology**. I also love programming from the core of my heart. I am a **self-taught programmer** and have been learning new things on my own. These days I am finding myself more involved in topics like **Machine Learning**, **Deep Learning** and **Image Processing**. As a member of the **RoboTech Club (RTC)** of NISER, I am trying to develop an autonomous rover using my **Reinforcement Learning** skills.

OUTSIDE COURSEWORK

Quantum Computation Internship

Prof. Prasanta K. Panigrahi

June 2022 – July 2022 | IISER Kolkata

Here I learned the basics of quantum computation and various aspects of it. I read a lot of papers suggested by my instructor and also did some activities on my own. Finally, I read a paper on a Quantum Robot and felt I could solve the problem addressed in the paper better. So I learned more about the topic and submitted my report on the same.

Internship Report: **Quantum Robot**

PyaR Seminar 2021

Prof. Raja GuhaThakurta

July 29^{th} to 31^{st} 2021 | Online

Here we learned the python programming language and how it can be used with Jupyter Notebook. We also learned the basics of astronomical data analysis using libraries like Numpy, Pandas, matplotlib etc. We were also briefed about some clustering algorithms used daily in this field.

GitHub Repository (materials): **PeithonKing/PyaR-2021**

Quantum Computation Course

IISER Tirupati & Qkrishi

2022 Summer Break | Online

I did a course on the basics of Quantum Computation and Quantum Information jointly organised by IISER Tirupati and Qkrishi. We learned the basic theory and had a hands-on experience with the IBM Quantum Experience. We also submitted a term project of Attacking Quantum Key Distribution Protocols. We demonstrated QKD algorithms like BB84 and E91 protocols in multiple devices on the same network using python libraries like Flask and Qiskit.

GitHub Repository: **PeithonKing/Attacking_QKD_Protocols**

"Start by doing what's necessary; then do what's possible; and suddenly you are doing the impossible!"

MOST PROUD OF

Came first in the ML4SCI Hackathon
The Higgs Challenge

Nov 2021 – Jan 2022

I, with my friend, participated in this competition. We were given 6 problems and were supposed to solve one (or more) of them using our Machine Learning skills. We went with the Higgs Challenge. We were given a dataset of 11 million data points and were expected to predict the presence of Higgs boson. We used an ensemble model which consisted of 5 neural network architectures and 1 XGBoost architecture. We were able to achieve an area of 0.88 under the ROC Curve.

Link to our GitHub Repository:
PeithonKing/ML_comp

SKILLS

Hard-working | Eye for detail | Tenacious | Self-motivated

Physics | **Handling Telescopes** | Python | C/C++ | JavaScript | Web Dev | Robotics | Arduino | Development Board Programming

LANGUAGES

English
Speaking, reading, writing

Bengali
Speaking, reading, writing

Hindi
Speaking, reading

German
Learning

Building a Drone

RoboTechClub NIER

June – July 2021 NISER

We built an autonomous drone with aid from RTC. The structure of the drone was built from scratch using aluminium box pipes, switchboard sunmica plates and some small 3D-printed parts. We used pixhawk 4 as the flight controller. It can fly in both manual mode or follow a predefined path using GPS. This drone can be developed further for learning.

Machine Learning Internship

Prof. Kripabandhu Ghosh

Dec 2021 – Jul 2022 IISER Kolkata

Here I specifically focussed on the Natural Language Processing (NLP) part of ML. I learned more about the different steps of doing NLP, their problems and the different processes to solve them. I also learned about some scoring algorithms for sorting documents in a corpus concerning relevance to a query. Finally, I succeeded in bringing a MAP value of 0.21 for the AILA dataset provided to me (the maximum MAP value achieved before that was 0.14).

GitHub Repository: **PeithonKing/AILA**

Member of the RoboTech Club

Prof. Subhankar Mishra's Lab

Jan 2021 – Present smlab-niser

As a member of the RoboTech Club, I have been learning about robotics and technology. I have been working on a project to develop an autonomous rover using Reinforcement Learning. I have also been learning about various other topics like Machine Learning, Deep Learning, Image Processing, etc. As a beginner, I have also laid my hands upon various sorts of development board programming and electronics.

What I have learned with RTC: **Certificate**

EDUCATION

Integrated M.Sc. (Physics Major)

National Institute of Science Education and Research

2020 – Present

Currently Studying here.

Higher Secondary Examination (12th)

Patha Bhavan High School

2020 Kolkata

WBCHSE Marks: $469_{/500}$ (93.8%)

Madhyamik Parikhsha (10th)

Patha Bhavan High School

2018 Kolkata

WBBSE Marks: $636_{/700}$ (90.86%)