

Reflective Essay on My Internship Experience at NASRDA

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This was my service as an intern at the National Space Research and Development Agency (NASRDA), Obasanjo Research Centre, Lugbe, Abuja and it had a positive influence on my personal and career growth. It was not only an informative experience to me but it also gave me a chance to apply theoretical knowledge acquired in the classroom in the scientific problems. In this research project, as a student studying the Computer Science major that majors in the study of Artificial Intelligence (AI), my choice to select NASRDA could be attributed to its status as the leading in space research, as well as its current interest in the field of artificial intelligence tools in Nigeria. I considered it the ideal place to get educated about how AI might be utilized in solving problems in satellite and space systems to streamline the national research and innovations community.

As early as the beginning, I was much aware of my goals to acquire skills in real-world programming, comprehend the application of AI in real-life scenarios and gain the ability to feel confident in the usage of AI technologies and applications. I was assigned to ICT Department under the guidance of Engr. Ishaku Gayus and his oversight was the wind to my sail to make the internship experience memorable. I learned under his supervision how artificial intelligence, computer vision, and machine learning are useful to the analysis data, technology in space and automated technology in NASRDA.

During the initial weeks, we were introduced to Python programming language which served as the base on which most of the projects I rang were founded. I also got acquainted with using Anaconda and Jupyter Notebook that enabled me to be able to run Python in a research environment successfully. Besides that, I was engaged with the study of the fundamentals of programming, including data type, type casting, operations, and control statements. Smaller project buildings that augmented this background included a Number Guessing Game and an Inventory Management Game in which I applied my learning and logic building ability in a good manner.

The better I got the better it worked, making me undertake more complicated projects. My projects there include: Color Detection, Shape Detection and Face Detection. The color space mode I employed in the Color Detection Project was HSV color space(Hue Saturation Value) to identify and remove desired colors in a video stream or image. Satellite imaging may be applied to the same concept where AI would automatically be able to recognize objects like vegetation, landscape etc. The Shape Detection project researched on contour and edge detection to be used to define simple geometrical shapes that can be applied to object detection in space images. Focusing on the use of computer vision in biometric identification and facial monitoring, Face Detection is the program that uses Haar cascade classifiers so as to recognize human faces in real-time, beneath which the application of the concept of computer vision is demonstrated.

Virtual Paint was my favorite of the projects. It was a collection of ideas that I had learned come together to create a complete virtual drawing machine of the real-time. The software was made by colored markers and had essentially transformed me to paint with my hand movements in front of the web camera. The exhibition was both engaging and pedagogical and exhibited how computer vision may be controlled by gesture, which is a new concept in robotics and human-computer interaction both of which form valid uses of NASRDA in automation in space.

As the internship progress carrying on, I began to study machine learning based on scikit-learn library. It showed me how to perform preprocessing of the data, feature encoding and model training and evaluation. I have dealt with real data e.g. Titanic.csv and Studentperformance.csv where you will have to clean the data and preprocess the data and split it into train and test set and run algorithms to draw inferences. This helped me in improving my understanding on data analysis and model evaluation.

My last project entailed one of the most entertaining initiatives, which is NASRDA Prediction Model of Launch Success. This is accomplished by deriving a predictive system using the tool of logistic regression which I am going to use to predict whether the rocket launch will yield successful result upon answering factors like the launch questionsite, the rocket, the mass of the payloads, the orbit type, and the weather conditions. The project assisted in demonstrating how AI and machine learning are directly related to the mission of NASRDA to improve decision-making and risk management on the space operations. It also was a reflection of the involvement of data science and engineering approach to application problems.

During my internship, I got an opportunity to tutor other interns on basic Python during the actual work. And on the first Friday I gave them variables, the type of data, operators and typecasting and finished, with a small program set about me. The next week, I used loops after which I challenged them to conditional statements and operations and the nutshell of comparing and combining operations then explicated to them on making projects like Guess the Number and a simple Score Recording Quiz Game. It is my teaching experience, which enabled me to enhance my personal learning, achieve confidence in knowledge presentation, and appreciate the necessity of knowledge transfer.

The two challenges that existed in executing the task during the internship hours are understanding complicated open-CV functions and troubleshooting the machine learning applications. Nevertheless, those obstacles gradually became overcome due to perseverance, the assistance of supervisors, and research using the internet. All the obstacles helped me to gain my problem-solving abilities, patience and technical resilience.

Overall, my internship at NASRDA was a transcendent academic experience that connected my theoretical education to real-world knowledge. It has increased my interest in artificial intelligence and motivated me to embark on a career in the use of technology to shorten space research and national development time lags. I am very grateful to NASRDA, the ICT Department and my supervisor, Engr. Ishaku Gayus for their support and mentorship in this journey. Such an understanding and skills cumulated along with the boost of confidence will surely help me in upcoming academic and professional problems in the domain of AI and space.

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