



**UNIVERSITY OF ILORIN
KWARA STATE, NIGERIA**

**FACULTY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING**

**A TECHNICAL REPORT ON THE
STUDENTS' INDUSTRIAL WORK EXPERIENCE SCHEME (SIWES)**

**UNDERTAKEN AT
THE NATIONAL CENTER FOR ARTIFICIAL INTELLIGENCE AND
ROBOTICS (NCAIR)**

**AT
THE E-GOVERNMENT TRAINING CENTER, PUBLIC SERVICE
INSTITUTE OF NIGERIA, KUBWA, ABUJA**

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COMPUTER ENGINEERING**

Overview of the Report

The Students' Industrial Work Experience Scheme (SIWES) is an initiative established by the Industrial Training Funds (ITF) and supported by the Federal Government. Its primary objective is to provide tertiary institution students with the necessary skills and exposure to prepare them for the industry in their respective fields of study. Additionally, it offers students the opportunity to familiarize themselves with work methods and gain practical experience in handling equipment and machinery that may not be available within their educational institutions. Another key aim of the program is to facilitate networking among students and professionals from various backgrounds, thereby enhancing their communication skills and ability to interact with people upon graduation.

This technical report presents a detailed account of my experiences during the Students' Industrial Work Experience Scheme (SIWES) at the National Centre for Artificial Intelligence & Robotics (NCAIR) in Abuja. During this program, I had the opportunity to engage with various devices, equipment, and advanced technologies, as well as programming languages such as Object-Oriented Programming and Functional Programming. Additionally, I explored frameworks related to Computer Vision, Generative Artificial Intelligence, and Embedded Systems. This training allowed me to learn from and collaborate with certified professionals in the domains of Computer Engineering and Artificial Intelligence, both within the organization and in the broader community.

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Acknowledgment

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1 INTRODUCTION

1.1 Background of SIWES

SIWES, an acronym for Students' Industrial Work Experience Scheme, was established in 1973 by Industrial Training Funds (ITF) for the sole purpose of ensuring tertiary institution graduates have the proper skills and experience for employment by the Nigerian Industries. SIWES was founded to be a skill training program to help expose and prepare students of tertiary institutions such as Universities, Polytechnics, and Colleges of Education, for the industrial work situation to be met after graduation. This scheme serves as a smooth transition from the classroom to the world of work and further helps in the application of knowledge. It provides students with the opportunity of acquiring the skills, exposure, and experience required in effectively managing and handling equipment that is not readily available to them in their respective institutions. SIWES was birthed out of the growing concern noticed by industrialists that graduates of higher institutions lacked sufficient practical knowledge for employment. This problem is indeed a general one, but it is majorly evident with students who study science and technology having little or no knowledge of the practical aspect of their field hence not suitable for employment. During the early stage, SIWES was single-handedly financed by Industrial Training Funds (ITF) not until it was too much to bear, then responsibilities were shared between the Industrial Training Funds (ITF) and the Federal Government. The SIWES scheme duration is generally twenty-six weeks (6 months) although it may also be dependent on the field of study and the Institution. The scheme is mostly done after the first year in Polytechnics that is ND1 and done after the second year or third year in universities depending on the Institution and Course study. The success and the effective management of this scheme have been due to the cooperation and well-played roles of the

Industrial Training Funds (ITF), the Federal Government, and the supervising agencies among others.

1.2 Aims & Objectives of SIWES

The objectives of the SIWES program are all about making students industry-ready. Such a program is a successful attempt to help students understand the underlying principles of their future work. The objectives of SIWES includes;

- Provide an avenue for students in institutions of higher learning to acquire industrial skills and experience relevant to their course of study
- To prepare specialists who will be ready for any working situations immediately after Graduation
- To teach students the techniques and methods of working with machinery and equipment that may not be available within the walls of an educational institution
- Make the transition from school to the world of work easier, and enhance students contacts for later job placement;
- To give students the ability to try and apply the given knowledge

1.2.1 Breast Cancer Detection Techniques

ultrasound images heavily rely on the expertise of radiologists, making it subjective and prone to variability.

2 DESCRIPTION OF THE ESTABLISHMENT OF ATTACHMENT

2.1 Location and Brief History of Establishment

The National Centre for Artificial Intelligence and Robotics (NCAIR) is one of NITDA's special purpose vehicles created to promote research and development on emerging technologies and their practical application in areas of Nigerian national interest. The centre, a state-of-the-art facility, along with its modern digital fabrication laboratory (FabLab), was commissioned on November 13th, 2020. It is co-located in the same building complex with the Office for Nigerian Digital Innovation (ONDI), at No. 790 Cadastral Zone, Wuye District, Abuja.

NCAIR as a digital innovation and research facility is focused on Artificial Intelligence (AI), Robotics and Drones, Internet of Things (IoT), and other emerging technologies, aimed at transforming the Nigerian digital economy, in line with the National Digital Economy Policy and Strategy (NDEPS). NCAIR is also focused on creating a thriving ecosystem for innovation-driven entrepreneurship (IDE), job creation, and national development.

2.2 Objectives of the Establishment

The main objectives of the training centre are to:

- Promote and support innovation, research, and development in AI, robotics, and 4IR technologies to enhance technological capabilities and solutions for various industries.
- Encourage the adoption and integration of AI, robotics, and 4IR technologies to improve productivity and efficiency in key sectors, fostering sustainable growth.
- Leverage advanced technological innovations to stimulate economic growth by creating new markets and enhancing job opportunities in high-tech fields.

- Enhance global competitiveness and quality of life through the strategic deployment and application of AI, robotics, and 4IR technologies, positioning the nation as a leader in the digital economy.

2.3 Organizational Structure (Organogram)

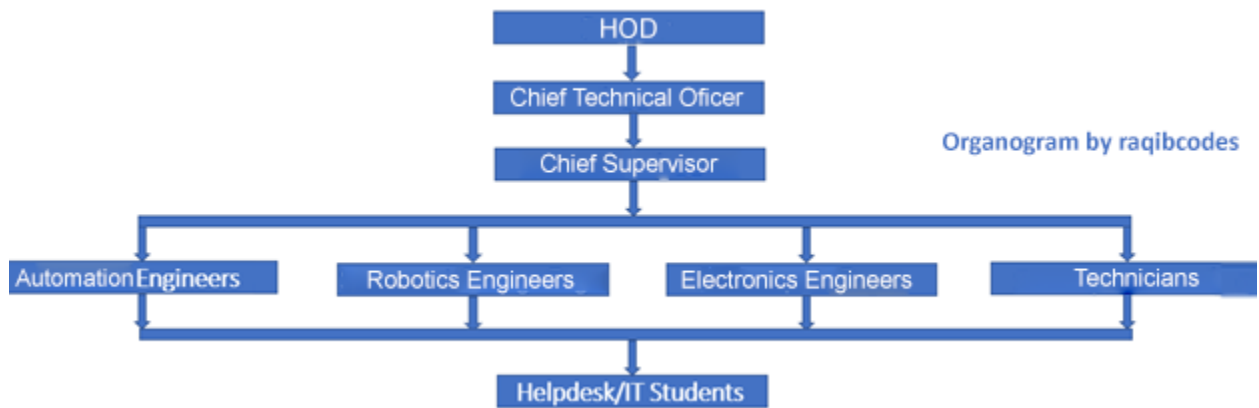


Figure 1: Organizational Structure

2.4 The Leaders of the Establishment

The establishment is overseen by the following individuals:

1. **National Director of NCAIR:** The National Director serves as the highest-ranking individual within the establishment, tasked with overseeing the management and allocation of responsibilities among engineers, technicians, researchers and other personnel.
2. **Chief Technical Officer (CTO) of NCAIR:** The CTO occupies the foremost technical role within the establishment, responsible for the management and distribution of tasks to engineers, thereby ensuring the establishment functions efficiently.
3. **Chief Supervisor:** The Chief Supervisor is responsible for overseeing the daily operations and activities of the establishment. They also facilitate tours for visitors within the establishment's facilities and hold authority over the Interns and Corps members affiliated with the establishment.

3 INDUSTRIAL EXPERIENCE I

3.1 Introduction

The report presented here highlights a pivotal stage in my academic sojourn as a computer engineering student, showcasing the valuable industrial experience I gained. This hands-on engagement enabled me to investigate the complex interplay between hardware and software, with a particular focus on Computer Vision and Generative Artificial Intelligence (GenAI). The impact of this experience goes beyond the boundaries of conventional classroom learning, offering a well-rounded comprehension of the real-world applications of the Python programming language and its associated development frameworks. In this introductory section, my objective is to provide a comprehensive overview, shedding light on the broader context surrounding this experience and underscoring its importance in relation to my Industrial Training.

3.2 Python