

Notification No.: 558/2024

Date of Award: 10-05-2024

Name of Scholar: Salman Ahmad Siddiqui

Name of Supervisor: Prof. Anwar Ahmad

Name of Department: Department of Electronics & Communication Engineering

Topic of Research: Designing Framework for Smart IoT Solutions using AI Techniques

### **Findings**

- The need for the creation of smart solutions with novel business solutions, greater efficiency, and previously unattainable levels of service has grown as a result of smart technology. Artificial intelligence (AI) aims to assess and convert the vast volumes of data that the many components of the Internet of Things (IoT) system provide into useful outputs.
- The thesis explores how AI and IoT integration enhances smart systems. It designs and analyzes real-time IoT solutions using AI to tackle technological challenges in smart applications.
- The research investigates current architectures, models, and approaches, incorporating new technologies for improved performance. It evaluates and compares these with existing AI and IoT solutions for smart systems across different domains. Novel methodologies are designed for diverse domains, viz., agriculture, healthcare, transportation, etc.
- The research incorporates utilization of standard as well as created real world dataset for the design and development of smart IoT solutions using AI methods. Sensory information's are also gathered via efficient methods for data gathering and analysis.
- Different machine learning and deep learning algorithms were trained and tested on these datasets to select the best performing model and deploy it for different smart IoT solutions.
- A number of factors, including model depth and type, task complexity, input, etc., influence the choice of models. The selection of efficient communication protocols and technologies, network infrastructure, data processing methods, sensor hardware etc. ensures the efficient transmission of IoT sensor data to the processing unit. The obtained results validate the efficacy of the developed systems.
- The development of various Internet of Things solutions through AI methods like machine learning and deep learning yields new conceptual, mathematical, and analytical models as well as the application of methods and computational techniques that incorporate state-of-the-art findings that can be used in industrial settings.