IoT and AI Application for Implementation of Smart Gardening and Irrigation System

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A THESIS
SUBMITTED TO
SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY
IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE IN INFORMATION TECHNOLOGY

December 2024

CERTIFICATION

I certify that I have read this thesis and that it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

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Prof. Pradeep K.W. Abeygunawardana

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DECLARATION

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Sri Lanka Institute of Information Technology or to any other institution for assessment for any other purpose.

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Date: 15.12.2024

ABSTRACT

IoT and AI Application for Implementation of Smart Gardening and Irrigation System

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This thesis presents a smart gardening and irrigation system that utilizes the Internet of Things and artificial intelligence. This system uses innovative technologies to enhance plant maintenance's efficiency and long-term viability. The system integrated a network of sensors and analytics driven by artificial intelligence to monitor environmental conditions and plant health. This technique facilitated precise gardening and disease management. A smartphone application was created for that, which aims to provide gardeners with real-time data and control over their gardening systems. The mobile application was enhanced with user-friendly and intuitive features, making it even easier to use. This innovative technology represents a significant advancement in smart home systems and sustainable living practices. It aims to save water, optimize plant growth, and provide a personalized and intelligent gardening experience. The research provides a concise overview of the design, implementation, and potential impact of this technology, emphasizing its significance in promoting gardening solutions that are visually appealing and ecologically sustainable.

Keywords: Smart Gardening, Internet of Things, Artificial Intelligence, ESP32, Disease Detection

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to all those who have supported and guided me throughout my journey to completing this MSc in Information Technology.

Firstly, I am profoundly grateful to my research supervisor, Prof. Pradeep Abeygunawardana, whose expertise, guidance, and encouragement were invaluable throughout the research and writing process. Your insightful feedback and unwavering patience inspired me to delve deeper and strive for excellence. I would like to extend my sincere thanks to the research coordinator, Mr. Prasanna Sumathipala, for their excellent guidance and assistance throughout this project. His coordination efforts and insights made a significant difference in the smooth execution of this research.

I extend my thanks to the Head of the Department of MIT, Prof. S. Sabraz Nawaz, of South Eastern University of Sri Lanka, whose knowledge and resources were instrumental in shaping this research. A special mention goes to the Lecturer, Faculty of Technology, Mr. Suhail Razeeth, who provided a supportive environment and constructive discussions that enriched my learning experience.

I am also indebted to my mother Mrs. Jahura, my husband Mohamed Rikaz, and my family and friends for their love, understanding, and encouragement. Your belief in me gave me the strength to persevere during challenging times.

Finally, I would like to acknowledge all individuals who provided support. Your contributions played a pivotal role in the successful completion of this thesis.

Thank you all for being part of this journey with me.

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LIST OF ACRONYMS AND ABBREVIATION

IoT	Internet of Things
AI	Artificial Intelligence
WSN	Wireless Sensor Network
UI	User Interface
UAT	User Acceptance Test
ML	Machine Learning
UX	User Experience
CC	Cloud Computing
RFID	radio frequency identification
AVC	Agriculture Value Chain
ESP32	Espressif32
PLS	Partial Least Square
SEM	Structured Equation Model
CR	Composite Reliability
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Usage Model