VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

A PROJECT REPORT ON

"MACHINE LEARNING AND IoT BASED WASTE MANAGEMENT MODEL"

Submitted in partial fulfillment for the award of Degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE & ENGINEERING

By

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ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY MOODBIDRI-574225, KARNATAKA

2023-24

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CERTIFICATE

This is to certify that the project entitled **"MACHINE LEARNING AND IoT BASED WASTE MANAGEMENT MODEL"** has been successfully completed by

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the bonafide students of **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING, ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–24. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project Work prescribed for the Bachelor of Engineering Degree.

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DECLARATION

We,

PAVAN KUMAR V

PRUTHVIRAJ K L

RACHITH M R

RAHUL

hereby declare that the dissertation entitled "**MACHINE LEARNING AND IoT BASED WASTE MANAGEMENT MODEL** " is completed and written by us under the supervision of our guide **Dr. G Srinivasan**, Professor, Department of Computer Science and Engineering, Alva's Institute of Engineering and Technology, Moodbidri, in partial fulfillment of requirements for the award of the degree **BACHELOR OF ENGINEERING** in **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the academic year 2023- 24. The dissertation report is original and it has not been submitted for any other degree in any university.

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ACKNOWLEDGEMENT

The satisfaction and euphoria that accompany a successful completion of any task would be incomplete without the mention of people who made it possible. Success is the epitome of hard work and perseverance, but steadfast of all is encouraging guidance.

So, with gratitude we acknowledge all those whose guidance and encouragement served as beacon of light and crowned the effort with success.

We thank our project guide **Dr. G Srinivasan,** Professor in the Department of Computer Science & Engineering, who has been our source of inspiration. She has been especially enthusiastic in giving her valuable guidance and critical reviews.

The selection of this project work as well as the timely completion is mainly due to the interest and persuasion of my project coordinator **Mrs. Vidya**, Senior Assistant Professor, Department of Computer Science & Engineering. We will remember her contribution forever.

We sincerely thank Dr. **Manjunath Kotari**, Professor and Head, Department of Computer Science & Engineering who has been the constant driving force behind the completion of the project.

We thank Principal **Dr. Peter Fernandes,** for his constant help and support throughout.

We are also indebted to **Management of Alva's Institute of Engineering and Technology, Mijar, Moodbidri** for providing an environment which helped us in completing the project.

Also, we thank all the teaching and non-teaching staff of the Department of Computer Science & Engineering for the help rendered.

Finally, we would like to thank my parents and friends whose encouragement and support was valuable.

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ABSTRACT

Our innovative waste management model harnesses the power of both machine learning (ML) and Internet of Things (IoT) technologies to revolutionize traditional waste management practices. Conventional waste management systems often grapple with inefficiencies stemming from a lack of real-time data, resulting in less than optimal resource distribution and negative environmental impacts. To overcome these challenges, our approach seamlessly integrates IoT sensors with ML algorithms, offering a dynamic and data-centric solution. By strategically deploying IoT sensors across waste collection points, we enable the continuous collection of real-time data on various parameters such as waste levels, composition. This wealth of data serves as the foundation for our ML algorithms, which analyse and interpret the information to derive actionable insights. One key aspect of our model lies in its ability. By leveraging ML algorithms, we can sort the waste into different categories, there by minimizing pollution, and greenhouse gas emissions. Additionally, our model can accurately predict fill levels at collection points, allowing waste management authorities to schedule collections more efficiently, avoiding both overfilling and unnecessary pickups. By analyzing historical data and trends, we can anticipate fluctuations in waste volume, enabling proactive planning and resource allocation. This foresight empowers waste management authorities to adapt their strategies accordingly, ensuring optimal utilization of resources and minimizing environmental impact. Through extensive simulations and real-world deployments, our model has demonstrated remarkable improvements in waste management efficiency, resource utilization, and environmental sustainability. By harnessing the synergy between ML and IoT technologies, our approach represents a significant step forward in modernizing waste management practices and building a cleaner, more sustainable future.