VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama" Belagavi – 590 010

PROJECT REPORT ON

"VISION ASSISTANT FOR VISUALLY IMPAIRED PEOPLE"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING

IN

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Submitted By

NAME	USN
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Under the Guidance of

Mr. SHRIKANTH N G

Sr. Assistant Professor

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28/05/2024

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Name of the Examiners	Signature with Date
i) Harish Kumar	28/05/2024
ii) Manjunath M	28/5/24

ABSTRACT

The "Visual Assistant for Visually Impaired People" project represents a pioneering initiative aimed at enhancing the independence, accessibility, and quality of life for individuals with visual impairments. Leveraging cutting-edge technologies such as computer vision, machine learning, and assistive devices, the project endeavors to address the challenges faced by the visually impaired community in navigating and interacting with their surroundings. At its core, the project focuses on the development of a comprehensive visual assistance system that interprets and analyzes visual information in real-time, providing users with accurate and contextually relevant guidance and support. Through seamless integration with specialized hardware, intuitive user interfaces, and voice-based interactions, the visual assistant aims to empower users to navigate diverse environments, recognize objects and people, and access information independently. Ethical considerations, including biases in AI algorithms and data privacy, are carefully addressed to ensure the trustworthiness and fairness of the technology. Moreover, the project emphasizes collaboration and partnerships with stakeholders across various sectors, including academia, industry, and the visually impaired community, to co-create solutions that meet the unique needs and preferences of users.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI, 590-018

PROJECT REPORT

ON

"MAZE WANDERER: AUTONOMOUS ROBOTIC PATH-FINDING SYSTEM"

Submitted in partial fulfillment of the requirements for the award of degree,

BACHELOR OF ENGINEERING

IN

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

By

ABDULLAH	4AL20AI001
KARAN KUMAR	4AL20AI019
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Under the Guidance of

Dr. RAMESH G

Associate professor

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Name of the Examiners	Signature with Date
1) Harish kunder	29/05/2024
2) Dr. Manjunath Ramaiah	29/5/24

ABSTRACT

This project explores the integration of reinforcement learning, specifically the Q-learning algorithm, into robotic systems for autonomous maze navigation. Driven by the imperative to instill adaptive learning capabilities in robots, the study focuses on enabling a robot to dynamically learn and refine its pathfinding strategies through interactions with a maze environment. Equipped with an array of sensors, the robotic system comprehensively perceives the maze's topology, with a Raspberry Pi serving as the central processing unit for decision-making. The study's central contribution lies in the iterative implementation of the Q-learning algorithm, facilitating the robot's association of specific actions with diverse states within the maze. This adaptive learning process culminates in the refinement of the robot's decision-making, optimizing its ability to autonomously navigate the maze over time. The ongoing work is to adjust the algorithm parameters and optimize the learning process of the robot to make it more accurate. The autonomous robot reached the destination from the starting point by the optimal route with shortest path and less timing.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
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PROJECT REPORT ON

"AUTONOMOUS JETBOT EXPLORER"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING IN

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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KHM 21/05/2024

Signature of the Guide
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KHM 21/05/2024

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Name of the Examiners	Signature with date
1. Harish Kunder	KHM 21/05/2024
2. Dr. Mahesh Kamath	29/5/24

ABSTRACT

The Autonomous JetBot Explorer investigates mobile robot navigation through a groundbreaking approach that merges real-world hardware with the controlled environment of simulation-based reinforcement learning. A JetBot with a camera acts as the actual obstacle avoidance platform. The navigation system's brain is a reinforcement learning algorithm called Proximal Policy Optimization (PPO). The JetBot is exposed to photos of both clear and blocked paths as part of a pre-training technique that teaches it how to avoid obstacles and find its way around them. This gives the JetBot the ability to navigate across regions that are blocked or clear. The pre-trained JetBot receives additional training in a simulated environment where PPO is used to improve its decision-making through a reward-penalty system dependent on successful navigation or crashes. At last, the whole understanding is applied to the actual world. In order to navigate a physical area and avoid obstacles in real-time, the JetBot makes use of its camera and trained model. This combination method has promise for the creation of autonomous robots capable of navigating dynamic environments, as it provides a potent way to train robots to adapt to unexpected conditions.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama" Belagavi – 590 010

PROJECT REPORT ON

"THE BUNK - YOUR VIRTUAL ASSISTANT"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING IN

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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EXTERNAL VIVA

Name of the Examiners	Signature with date
1. Harish Kunder	28/05/2024.
2. Manjunath H	

ABSTRACT

The development of the "BUNK" multifunctional virtual assistant application represents a significant endeavor aimed at providing users with a seamless and intuitive interaction experience across various platforms. Incorporating voice command recognition, a chat interface, and communication functionalities such as calls, video calls, and emails, BUNK is designed to streamline daily activities and tasks. Its modular architecture enables the efficient handling of distinct components, leveraging speech-to-text technology for voice commands and integrating relevant APIs and libraries for communication features. The user interface prioritizes accessibility and ease of use, ensuring that users can navigate effortlessly and access all functionalities with convenience. Rigorous testing methodologies, including unit tests and user acceptance testing, guarantee the reliability and robustness of the application. The ongoing efforts focus on enhancing existing features and introducing new functionalities to continually improve the capabilities of the virtual assistant. In essence, BUNK represents a comprehensive solution for users seeking intelligent assistance in managing their daily routines and optimizing productivity.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama" Belagavi – 590 010

PROJECT REPORT ON

"DRONE INVENTORY MANAGEMENT FOR RESOURCE MAPPING"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING IN

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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29/04/2024

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i) Harish Kunder	29/05/2024
ii) Dr. Manjunath Kamath K	29/5/24

ABSTRACT

Inventory management is a critical aspect of logistics and supply chain operations, with efficiency and accuracy being paramount. Traditional methods often face challenges such as manual errors, time-consuming processes, and limited scalability. This paper presents a novel approach to inventory management leveraging mini-drones equipped with sensors and communication modules. The architecture integrates drone flight control, sensor data acquisition, data processing, and inventory database management to enable real-time tracking and management of inventory items within a warehouse environment. A proof-of-concept implementation demonstrates the feasibility and benefits of this approach, showcasing how mini-drones can autonomously navigate warehouse spaces, collect inventory data, and update inventory records in a centralized system. The results highlight significant improvements in inventory accuracy, speed of data collection, and operational efficiency, paving the way for enhanced inventory management practices in modern logistics ecosystems.

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PROJECT REPORT ON

"TRADIFY: DEEP LEARNING-POWERED STOCK MARKET FORECASTING"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING IN

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2. Manjunath H	28/5/24

ABSTRACT

In the ever-changing world of financial markets, accurately predicting stock values poses a significant challenge. This study addresses this challenge by integrating real-time data analysis with advanced methodologies such as Sentiment Analysis, Linear Regression, and Long Short-Term Memory (LSTM) networks. LSTM's capability to identify complex patterns in time series data is leveraged, while Sentiment Analysis adds a qualitative dimension by gauging market sentiment from textual data. Linear Regression complements LSTM by establishing correlations within the data. Through empirical investigation, this research demonstrates the efficacy of combining these methodologies, achieving a predictive accuracy of 97% in stock price modelling. The results underscore the importance of real-time data integration and the synergistic benefits of employing diverse analytical techniques. By integrating these approaches, latent insights are unearthed, facilitating more strategic financial forecasts and informed investment decisions. This study highlights the potential for improved forecasting accuracy and enhanced decision-making in the realm of financial markets.

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PROJECT REPORT ON
CREDIT CARD TRANSACTIONS INTEGRITY MONITORING USING MACHINE LEARNING

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING
IN
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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2. M. Manjunath	28/5/24

ABSTRACT

In the domain of online transactions, the imperative need for robust Credit Card Fraud Detection Systems has become increasingly evident. This project embarks on the development of a sophisticated fraud detection system, leveraging cutting edge machine learning algorithms to fortify financial security and instill trust in consumers and financial institutions alike. Central to the project's methodology is the meticulous duration and pre-processing of datasets, ensuring the integrity and suitability of the data for subsequent model training endeavors. Through the judicious application of diverse machine learning algorithms, including Logistic Regression, Naive Bayes, and Decision Trees, the project endeavors to engineer highly accurate and resilient models adept at discerning fraudulent transactions. These models are subjected to rigorous evaluation and comparison, with metrics such as accuracy, precision, recall, and F1 score meticulously analysed to ascertain the most efficacious algorithm for seamless integration with the frontend interface. By prioritizing the seamless fusion of accuracy, reliability, and real-time functionality, the project aims to furnish users with an indispensable tool for proactive transaction monitoring and fraud mitigation. In doing so, it seeks to not only curtail financial losses but also cultivate an environment of confidence and trust in digital credit card transactions.

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PROJECT REPORT ON

"FACIAL EMOTION RECOGNITION WITH RECOMMENDATION SYSTEM"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING IN

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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in partial fulfillment for the award of **BACHELOR OF ENGINEERING** in **DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–2024. 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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1. Harish kundar
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28/05/2024

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ABSTRACT

Facial emotion recognition, coupled with music recommendation systems, presents a transformative approach to enhancing user experiences in digital platforms. In order to identify facial expressions and suggest tailored music to users based on their emotional states, this project intends to create an integrated system that makes use of deep learning techniques, context-aware recommendation algorithms, and web development frameworks. The methodology uses TensorFlow and OpenCV for model creation and inference, and integrates Convolutional Neural Networks (CNNs) for face emotion recognition, including the MobileNetV2 architecture. By integrating context-aware recommendation approaches, users' emotional cues are taken into account while creating playlists of music, which increases user pleasure and engagement. For backend server development, the Flask framework is used, which makes it easier to integrate with external services and frontend interfaces. Softmax regression is used to classify facial expressions into many classes, allowing for reliable inference and precise music recommendations. The technology seeks to revolutionise how consumers interact with music in digital spaces by delivering personalised and sympathetic interactions through rigorous testing and validation. By advancing human-computer interaction, this initiative opens the door for more emotionally aware and intuitive technologies in a variety of fields

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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PROJECT REPORT ON
"REAL TIME OBJECT DETECTION AND TRACKING"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING

IN

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Submitted By

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Under the Guidance of

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Mr. Kiran Raj K M **Project Guide**	21/05/2024 **Prof. Harish Kunder** **Head of the Department**	**Dr. Peter Fernandes** **Principal**

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ABSTRACT

The main idea of this project is to combine the SSD MobileNetV2 model-based Jetson-inference framework with NVIDIA's Jetson Nano-powered mobile robotics platform Jetbot to achieve effective object tracking and detection. By utilizing the model's speed and accuracy for real-time object detection tasks, the system seeks to monitor and recognize things in its surroundings with minimal latency and high precision. Pre-trained weights for the SSD MobileNetV2 model are used via a pipeline that includes data collection, model training, inference, and motor control. These weights may be adjusted on certain datasets to better suit the application domain. On the Jetson Nano, real-time inference enables quick object identification and classification, while object tracking algorithms preserve frame continuity for efficient object movement tracking. The system's practical application in diverse situations is demonstrated by experimental validation, highlighting its potential for tasks like navigation, surveillance, and human-robot interaction. This progresses the field of autonomous systems and robotics.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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PROJECT REPORT ON

"YOUMATTER - THE MENTAL HEALTH CHATBOT"

Submitted in partial fulfillment of the requirements for the award of degree

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ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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13/05/24 — 22/05/2024

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Name of the Examiners	Signature with date
1. Harish Kunder	29/05/2024
2. Dr. Manjunath Ramath K	29/5/24

ABSTRACT

In many parts of the world, there just aren't enough trained mental health professionals to help everyone who needs support. Number of people with mental health issues end up not getting the help they really need. According to the World Health Organization, there's a global shortage of health workers trained in mental health. To resolve this issue chatbots are used. They could be a scalable solution, providing an interactive way for people to engage in behavioural health interventions.

Chatbots are systems that can talk and interact with humans, using spoken, written, and visual languages. They have got the potential to be real helpful tools for people with mental disorders, especially for those who might be hesitant to seek mental health advice, there are quite a few chatbots that have been developed, like SERMO and Aapka Chikitsak. However, they do face some issues, like not giving analysed reports and graphical data. To sort this out, this project called YouMatter has been proposed and designed. YouMatter is aimed at addressing this problem head-on. YouMatter is a mental health care chatbot developed using a large language model (LLM) to offer support and resources to individuals seeking assistance with their mental well-being. By leveraging advanced natural language processing, YouMatter aims to provide accessible and empathetic assistance in navigating mental health challenges. It uses WebSockets to let you chat with the chatbots in real-time. This means you can get help whenever you need it, whether it's day or night.

The chatbots can analyse your mental health over time and show you graphs to help you understand how you're doing. They can even send you emails with tips on how to improve your mental health. So, you can keep track of your progress and get support whenever you need it. YouMatter's aim is to ensure that mental health support is accessible to everyone, anytime. By leveraging chatbots and advanced tech, YouMatter wants to remove obstacles to mental health care. Ultimately, it's all about helping people feel better and live happier lives.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
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PROJECT REPORT

ON

"WEATHER FORECASTING USING LSTM"

Submitted in partial fulfilment of the requirements for the award of degree,

BACHELOR OF ENGINEERING

IN

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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15/05/2024

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29/05/2024

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Name of the Examiners	Signature with Date
1) Harish Kundar	29/05/2024
2) Dr. Manjunath Kamath C	29/5/24

ABSTRACT

Weather forecasting predicts future weather conditions. Weather forecasting is critical in several areas like crop planning based on the weather, transportation for safety, planning the energy demands, disaster management for preparedness, and public health for protecting vulnerable populations from weather-related risks like heatwaves and air pollution.

Weather forecasting is done using historical data, current atmospheric conditions, and mathematical models. Machine learning is a well-known technique to predict weather forecasting. To predict the weather, there are many machine learning models and techniques such as k Nearest Neighbor (KNN), Support Vector Machine (SVM), Gradient Boost (GB), and Extreme Gradient Boost (XGB) are used. However, these techniques lack accuracy, computation speed and also in precision. To address this issue, this project proposed and designed a novel method to predict the weather using the Long Short-Term Memory (LSTM) technique. LSTM is renowned for modelling temporal dependencies in data and is suitable for predicting weather patterns. Integrating LSTM with real-time datasets from weather APIs aims to provide accurate and timely forecasts. This direct access to real-time data enhances adaptability to changing conditions. Leveraging machine learning, the system analyzes vast data, improving forecast accuracy. These applications span agriculture, transportation, disaster preparedness, and public safety, where precise weather information is crucial for informed decision-making and risk mitigation.

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PROJECT REPORT ON

"MUSIC GENRE CLASSIFICATION & RECOMMENDATION USING CNN AND MOBILENETV2"

Submitted in partial fulfillment of the requirements for the award of degree

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Name of the Examiners	Signature with Date
Harish Kumar	21/05/2024
Dr - Manjunath Kamath K	29/5/24

ABSTRACT

This project represents a significant advancement in the field of music genre classification and recommendation by harnessing the power of MobileNet's transfer learning capabilities and custom-designed CNN architectures. By leveraging a diverse dataset and transforming audio samples into spectrograms, the system achieves robust feature representation for input. Through extensive training and fine-tuning processes, both MobileNet and the specialized CNN model are optimized to accurately classify music genres. Evaluation metrics such as accuracy loss and provide insights into the performance of the trained models. Upon deployment, the system seamlessly integrates into digital music platforms, offering users tailored recommendations based on their preferences and listening history. Overall, the results demonstrate the efficacy of transfer learning and CNNs in improving genre classification accuracy and enhancing the user experience in discovering and enjoying music.

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PROJECT REPORT ON

"FORECASTING FINANCIAL FORTUNES: INTEGRATING ARIMA, LSTM, AND LINEAR REGRESSION FOR STOCK MARKET PREDICTION"

Submitted in partial fulfillment of the requirements for the award of degree

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Name of the Examiners	Signature with date
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2.	28/5/24

ABSTRACT

This paper explores the effectiveness of three distinct models—autoregressive integrated moving average (ARIMA), long short-term memory (LSTM) networks, and linear regression—in predicting stock prices. While each model possesses its own set of advantages and drawbacks, the study aims to compare their performance by analyzing their underlying principles and predictive outcomes. Notably, the LSTM model exhibits promising predictive capabilities, albeit being susceptible to data processing nuances. In contrast, the ARIMA model outperforms traditional artificial neural networks (ANN) but falls short of LSTM's accuracy. Moreover, the integration of time series data with external factors emerges as a promising avenue for future research. Given the dynamic nature of stock markets influenced by factors like politics, economics, and societal trends, accurate forecasting tools are in high demand. This study leverages fundamental and technical analyses, with a focus on financial indicators and past price trends, to predict future stock prices. By employing deep learning and machine learning algorithms such as LSTM, ARIMA, and linear regression, the study evaluates their efficacy in forecasting stock trends. Through rigorous data preprocessing—including feature scaling, autocorrelation analysis, and dataset partitioning—the models are trained and tested using historical stock price data encompassing open, close, high, and low values. The results underscore the importance of selecting the most suitable model and parameter values tailored to individual company datasets for optimal predictive performance. Ultimately, this research aims to empower investors with robust forecasting models to navigate the complexities of the stock market and enhance their decision-making processes.