

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
"Jnana Sangama", Belagavi-560014, Karnataka



A PROJECT REPORT ON

"ALZHEIMER'S RISK PREDICTION USING DEEP LEARNING"

*SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
AWARD OF THE DEGREE*

**BACHELOR OF ENGINEERING
IN
COMPUTER SCIENCE & ENGINEERING**

Submitted By

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MANOJKUMAR PATIL	[1SV20CS023]
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Under the guidance of

Dr. Girish L B.E., M.Tech., PhD.
Associate Professor & HOD
Dept. of AI&DS, SIET, Tumakuru



Department of Computer Science and Engineering

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Affiliated To Visvesvaraya Technological University)

Sira Road, Tumakuru – 572106, Karnataka.

2023-2024



Sri Shridevi Charitable Trust (R.)

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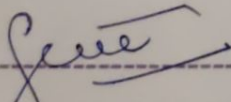


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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

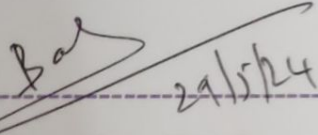
CERTIFICATE

This is to certify that, the Project report of entitled "ALZHEIMER'S RISK PREDICTION USING DEEP LEARNING" has been Successfully carried out by G MALINGARAYA [1SV20CS010], JAYANTH D S [1SV20CS016], MANOJ KUMAR PATIL [1SV20CS023], MANTESH H RANGARADDI [1SV20CS024] in partial fulfillment for the award of **Bachelor of Engineering in Computer Science & Engineering** of the **Visvesvaraya Technological University, Belagavi** during the academic year **2023-24**. It is certified that all the corrections/suggestions indicated for internal assessments have been incorporated in the report. The Project report has been approved as it satisfies the academic requirements in respect of Project work phase II prescribed for the Bachelor of Engineering Degree.



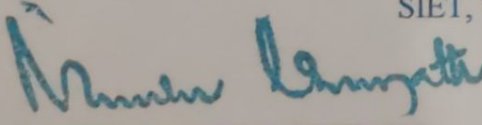
Signature of the Guide

Dr. Girish L B.E., M.Tech., PhD.
Associate Professor & HOD
Dept. of AI&DS,
SIET, Tumakuru.

 29/5/24

Signature of the H.O.D

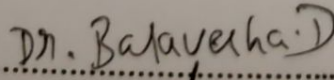
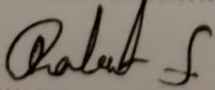
Dr. Basavesha D BE., M.Tech., PhD.
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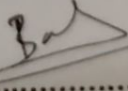
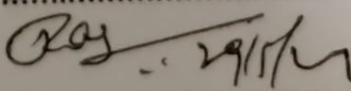
Signature of the Principal

Dr. Narendra Viswanath M.E., Ph.D., MIE, MISTE, MIWS., FIV.,
Principal, SIET, Tumakuru

Name of the Examiners

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- 2 

Signature with date

-  29/5
-  29/5/24



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DECLARATION

We, G MALINGARAYA [1SV20CS010], JAYANTH D S [1SV20CS016], MANOJ KUMAR PATIL [1SV20CS023], MANTESH H RANGARADDI [1SV20CS024] student of VIII semester **B.E** in Computer Science and Engineering, at Shridevi Institute of Engineering and Technology, Tumakuru, here by declare that, the Project work phase II entitled "ALZHEIMER'S RISK PREDICTION USING DEEP LEARNING" embodies the report of our Project work carried out under the guidance of **Dr. Girish L, Associate Professor and HOD, Department of AI&DS, SIET, Tumakuru** as a partial fulfillment of requirements for the award of the degree in **Bachelor of Engineering in Computer Science and Engineering of Visvesvaraya Technological University, Belagavi**, during the academic year **2023-24**. The Project has been approved as it satisfies the academic requirements in respect to the Project work Phase II.

Place:

Student Name & Signature

Date:

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BONAFIDE CERTIFICATE

This is to certify that the project entitled "ALZHEIMER'S RISK PREDICTION USING DEEP LEARNING" is a bonafide in the work of, G MALINGARAYA [1SV20CS010], JAYANTH D S [1SV20CS016], MANOJ KUMAR PATIL [1SV20CS023], MANTESH H RANGARADDI [1SV20CS024] of VIII semester of **B.E** in Computer Science and Engineering carried out at Shridevi Institute of Engineering and Technology in partial fulfillment of requirements for the award of **Bachelor of Engineering in Computer Science and Engineering of the Visvesvaraya Technological University, Belagavi** under my supervision and guidance. Certified to the best of my knowledge the work reported here is not a part of any other thesis on the basis of which degree or award was conferred on earlier occasion to these or any other candidates.

Guide:

Dr. Girish L B.E., M.Tech., PhD.

Associate Professor & HOD

Dept of AI&DS, SIET, Tumakuru

ACKNOWLEDGEMENT

This Project will be incomplete without thanking the personalities responsible for this venture, which otherwise would not have become a reality.

We express our profound gratitude to **Dr. Narendra Viswanath**, Principal, S.I.E.T, for his moral support towards completing our Project work.

We would like to thank Head of Department **Dr. Basavesha D** Head, Department of CSE, SIET for providing all the support and facility.

We would like to thank my guide **Dr. Girish L** Associate Professor, Head, Department of AI&DS, SIET for his help, sharing his technical expertise and timely advice.

We would like to thank my Project Coordinators, **Dr. Girish L** Associate Professor, Head, Department of AI&DS and **Mrs. Rashmi N** Assistant Professor, Department of CSE, SIET for providing all the support and facilities.

We would like to express our sincere gratitude to all teaching and non-teaching staff of the Department of CSE for guiding us during the project work by giving valuable suggestion and encouragement.

By,

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ABSTRACT

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by progressive cognitive decline, memory loss, and impaired daily functioning. Early and accurate diagnosis is crucial for effective intervention and management of the disease. Magnetic Resonance Imaging (MRI) plays a vital role in aiding the diagnosis of AD by detecting structural changes in the brain associated with the disease progression. In recent years, machine learning techniques, particularly deep learning approaches using Convolutional Neural Networks (CNNs), have shown promise in assisting with AD diagnosis through automated analysis of MRI scans. This study proposes a novel machine learning framework for the early detection and classification of AD from brain MRI data. By leveraging transfer learning and fine-tuning pre-trained CNN models, we aim to improve the accuracy and efficiency of AD diagnosis. Our approach involves preprocessing, feature extraction, and classification steps to enhance image quality, extract relevant biomarkers, and classify MRI scans into AD and non-AD categories. Through rigorous validation and evaluation, including quantitative metrics and visualization techniques, we demonstrate the efficacy of our proposed method in aiding clinicians with early AD diagnosis, thus facilitating timely interventions and improved patient outcomes.

Alzheimer's disease (AD) is a devastating neurodegenerative condition characterized by progressive deterioration of cognitive function and memory loss. Timely and accurate diagnosis is essential for effective patient care and treatment planning. Magnetic Resonance Imaging (MRI) is a valuable tool in the diagnosis of AD, enabling visualization of structural changes in the brain associated with the disease.

Recent advancements in machine learning, particularly deep learning techniques such as Convolutional Neural Networks (CNNs), have shown promise in automating the analysis of MRI data for AD diagnosis. This study presents a comprehensive machine learning framework aimed at early detection and classification of AD using MRI scans.

Our approach integrates transfer learning and fine-tuning of pre-trained CNN models to leverage existing knowledge and enhance diagnostic accuracy. Through preprocessing steps to optimize image quality and feature extraction methods to capture relevant biomarkers, our framework enables robust classification of MRI scans into AD-positive and AD-negative categories.