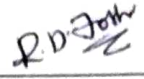

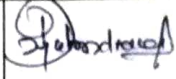

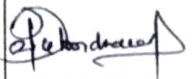
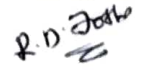
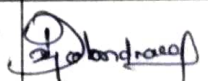
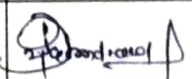
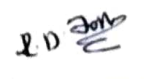


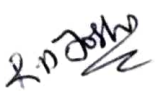



B.L.D.E.A.'s
S.B.Arts and K.C.P Science College, Vijayapur
M.Sc(CS) Programme
IV Sem 2023-2024

Project Guide Allotment - Synopsys Submission List

S. No	USN	Student Name	Project Title	Name of Guide	sign
1	P15KM22S038001	SAVITA MADAR	Malicious URL Detection using Blacklist Algorithm.	Prof. R.D.Joshi	
2	P15KM22S038002	PRAJWAL DHAREPPA YALGUDRI	Toxic Comment Classification System using Deep Learning	Dr. D.A.Mulimani	
3	P15KM22S038003	ANUSHA A KULKARNI	Pneumonia Detection using FastAI and Flask	Prof. Pavankumar Mahindrakar	
4	P15KM22S038004	GURURAJ PARAPPA JATTI	Image Stegonography using Python	Dr. D.A.Mulimani	
5	P15KM22S038005	DUNDAYYA GANGAYYA PUJERI	Facial Emotion Detection using Convolution Neural Networks	Prof. Pavankumar Mahindrakar	
6	P15KM22S038006	SAHANA JALAWADI	Brain Tumor Detection using Convolutional Neural Network	Prof. R.D.Joshi	
7	P15KM22S038007	PALLAVI HADIMURNAVAR	Control of Phishing Sites Using Machine Learning Techniques	Prof. Pavankumar Mahindrakar	
8	P15KM22S038008	AISHWARYA ANANTAPUR	Skin Deseas Detection and Treatment Susceptability using AI	Prof. Pavankumar Mahindrakar	
9	P15KM22S038011	SUSHMITA BASAVARAJ TADASALUR	Job Portal Using Java	Prof. R.D.Joshi	
10	P15KM22S038012	MARUTI KANADE	Drive Safe using Python in Machine Learning	Dr. D.A.Mulimani	
11	P15KM22S038013	SUDHA MAJJAGI	Fake Job Prediction using Data Mining Techniques	Dr. D.A.Mulimani	


Co-ordinator
M.Sc. (C.S.) Programme
S.B.Arts & K.C.P.Science College,
Vijayapur.


Principal
S.B.Arts & K.C.P.Science College,
Vijayapur.

RANI CHANNAMMA UNIVERSITY, BELAGAVI



B.L.D.E. ASSOCIATION'S
S.B. ARTS & K.C.P SCIENCE COLLEGE, VIJAYAPURA
(Re-Accredited at B++ grade by NAAC in IV Cycle)



M.Sc(CS) Programme

(Affiliated To Rani Channamma University, Belagavi)

A PROJECT REPORT
ON
“PNEUMONIA DETECTION USING FASTAI”

Under the Guidance of
Prof. Pavankumar Mahindrakar

Submitted By
Anusha Kulkarni
USN No: P15KM22S038003

RANI CHANNAMMA UNIVERSITY, BELAGAVI



B.L.D.E. ASSOCIATION'S
S.B. ARTS & K.C.P SCIENCE COLLEGE, VIJAYAPURA
(Re-Accredited at B++ grade by NAAC in IV Cycle)



M.Sc(CS) Programme **CERTIFICATE**

This is to certify that the project entitled

“PNEUMONIA DETECTION USING FASTAI”

is being submitted By Miss. Anusha Kulkarni (P15KM22S038003)

For the award of M.Sc (*Computer Science*) by the Rani Channamma University,
Belagavi as bonafide record of the project work carried out by her under our
supervision for the academic year 2023-2024


Guide

Prof. Pavankumar Mahindrakar


Co-ordinator

Prof. R.D. Joshi


Principal

Dr. R.M. Mirdhe

Internal Examiner: 

External Examiner: 

ACKNOWLEDGEMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and I am extremely privileged to have got this all along the completion of my project. All that I have done is only due to such supervision and assistance and I would not forget to thank them.

I respect and thank Co-ordinator Prof.(Smt) R. D. Joshi, for providing me an opportunity to do the project work in "PNEUMONIA DETECTION USING FASTAI" and providing support and guidance which made me to complete the project duly. I am extremely thankful to her for providing such a nice support and guidance, although she had busy schedule managing the Academic affairs.

I owe my deep gratitude to my Lecturers Dr. D. A. Mulimani and Prof. Pavankumar Mahindrakar who took a keen interest in project work and guided me, till the completion of project work by providing all the necessary information for developing a good project.

I also take this opportunity to express my gratitude to Principal Dr. R. M. Mirdhe madam for providing necessary resources to complete this project in a successful manner.

Anusha Kulkarni

USN:P15KM22S038003

Table of Contents

Abstract.....	i
1. Introduction.....	1
1.1. Problem Statement.....	1
1.2. Objectives.....	1
1.3. Project Scope.....	2
2. Methodology.....	4
2.1 Block Diagram.....	4
2.2 Steps.....	5
3. Data Collection.....	6
4. Data Preprocessing.....	9
5. Data Training.....	11
6. Model Evaluation.....	14
7. Model Testing and Deployment.....	16
7.1 Model Testing.....	16
7.2 Model Deployment.....	17
8. Hardware and Software Requirements.....	19
8.1 Hardware Requirement.....	19
8.2 Software Requirement.....	19
9. Technologies.....	20
10. Implementation.....	22
11. Screenshots.....	24
12. Conclusion.....	27
13. Future Enhancement.....	28
14. References.....	29

ABSTRACT

Pneumonia remains a significant global health concern, with early and accurate detection crucial for effective treatment and management. This project explores the application of deep learning techniques, specifically leveraging the FastAI library with a ResNet50 architecture, to automate the detection of pneumonia from chest X-ray images. The FastAI framework offers a streamlined approach to training deep neural networks, enabling efficient model development and optimization.

The project involves several key phases: dataset preparation, model training using the FastAI library on a ResNet50 convolutional neural network architecture, and deployment of the trained model using Flask, a lightweight web framework. The dataset utilized for training and evaluation consists of labelled chest X-ray images, with annotations indicating the presence or absence of pneumonia.

After training the model on a suitable computing platform, Flask is employed to create a web application interface where users can upload chest X-ray images for real-time prediction. The Flask application integrates the trained model to classify uploaded images as either indicating pneumonia or being normal. The deployment process ensures that the model remains accessible and usable beyond the development environment, facilitating practical application in clinical settings or diagnostic support systems.

1 Introduction:

1.1 Problem Statement:

Every year, a large number of children worldwide die from pneumonia. In 2016, an estimated 1.2 million cases of pneumonia in children under the age of five were recorded, with 880,000 deaths.

Pneumonia is a respiratory infection caused by bacteria or viruses that affects many people, particularly in poor and underdeveloped countries with high levels of pollution, unsanitary living conditions, overcrowding, as well as inadequate medical infrastructure.

Clinical diagnosis of the lung or chest X-ray might be in great demand. However, it is sometimes more difficult than lung diagnosis by computed tomography imaging for the chest.

1.2 Objectives:

1. Accurate Classification of Pneumonia Types:

The primary goal is to develop a model that can accurately classify chest X-ray images into three categories: Normal, Viral Pneumonia, and Bacterial Pneumonia.

2. Utilization of Fastai and ResNet50:

Leverage the Fastai library to simplify and expedite the deep learning process. Fastai provides high-level abstractions for model building, data augmentation, and training.

Use ResNet50, a powerful convolutional neural network pre-trained on the ImageNet dataset, as the backbone of the model.

3. Develop and Train a Deep Learning Model:

Utilize the FastAI framework and ResNet50 architecture to develop a robust deep learning model capable of accurately detecting pneumonia from chest X-ray images.

4. Preprocessing and Data Augmentation:

Implement effective preprocessing techniques like resizing, normalization, and data augmentation to improve model generalization and prevent overfitting.

5. Achieve High Accuracy and Performance: Aim to achieve high accuracy, sensitivity, and specificity in pneumonia detection, ensuring the model's reliability.

RANI CHANNAMMA UNIVERSITY, BELAGAVI



**B.L.D.E. ASSOCIATION'S
S.B. ARTS & K.C.P SCIENCE COLLEGE,
VIJAYAPURA**

(Re-Accredited at B++ grade by NAAC in IV Cycle)



M.Sc(CS) Programme

(Affiliated To Rani Channamma University, Belagavi)

A PROJECT REPORT

ON

**“BRAIN TUMOR DETECTION USING
CONVOLUTION NEURAL NETWORK”**

Under the Guidance of

Prof. R.D.Joshi

Submitted By

Sahana Jalawadi

USN No: P15KM22S038006

RANI CHANNAMMA UNIVERSITY, BELAGAVI



**B.L.D.E. ASSOCIATION'S
S.B. ARTS & K.C.P SCIENCE COLLEGE,
VIJAYAPURA**

(Re-Accredited at B++ grade by NAAC in IV Cycle)



M.Sc(CS) Programme

CERTIFICATE

This is to certify that the project entitled
**“BRAIN TUMOR DETECTION USING
CONVOLUTION NEURAL NETWORK”**

Is being submitted by Miss. **Sahana Jalawadi (P15KM22S038006)** For the award of M.Sc (*Computer Science*) by the Rani Channamma University, Belagavi as bonafied record of the project work carried out by her under our supervision for the academic year 2023-2024


Guide


Prof. R.D. Joshi


Co-coordinator

Prof. R.D. Joshi


Principal

Dr. R.M. Mirdhe

Internal Examiner: 

External Examiner: 

ACKNOWLEDGEMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and I am extremely privileged to have got this all along the completion of my project. All that I have done is only due to such supervision and assistance and I would not forget to thank them.

I respect and thank Co-ordinator **Prof. (Smt) R D Joshi**, for providing opportunity to do the project work in **"BRAIN TUMOR DETECTION USING CONVOLUTION NEURAL NETWORK"** and providing support and guidance which made me to complete the project duly. I am extremely thankful to her for providing such a nice support and guidance, although she had busy schedule managing the Academic affairs.

I owe my deep gratitude to my Lecturers **Dr.D.A.Mulimani** and **Prof. Pavankumar Mahindrakar** who took a keen interest in project work and guided me, till the completion of project work by providing all the necessary information for developing a good project.

I also take this opportunity to express my gratitude to Principal, **Dr. R.M.Mirdhe mam** for providing necessary resources to complete this project in successful manner.

Sahana M Jalawadi
USN: P15KM22S038006

Table of contents

Chapter 1	1
Introduction	1
1.1 Brain Anatomy	2
1.2 Motivation	3
1.3 Objective	4
1.4 Problem statement	4
1.5 Scope	5
1.6 Overview of the Project	5
Chapter 2	6
Literature Survey	6
Chapter 3	9
Challenges In Tumor Classification	9
Chapter 4	10
Block Diagram	10
4.1 Image Pre-Processing And Image Enhancement	11
4.1.1 Image Pre-Processing	11
4.1.2 Image Enhancement	12
4.2 Image Segmentation	13
4.3 Image Classification	14
4.3.1 Sequential	15
4.3.1 Convolution	15
4.3.1 Pooling	16
4.3.1 Flattening	16
4.3.1 Batch Normalization	17
4.3.1 Fully Convolution	18

Chapter 5	19
Experimental Analysis And Results	19
5.1 System configuration	19
5.1.1 Software Requirements	19
5.1.2 Hardware Configuration	21
5.2 Data Flow	21
5.3 Results and Discussion	23
5.4 Experimental Results	24
5.5 Performance Evaluation	26
Chapter 6	27
Advantages and Applications	27
6.1 Advantages	27
6.2 Applications	27
Chapter 7	28
Conclusion and Future Scope	28
7.1 Conclusion	28
7.2 Future Scope	28
References	29

ABSTRACT

The human brain is the major controller of the humanoid system. The abnormal growth and division of cells in the brain lead to a brain tumour, and the further growth of brain tumours leads to brain cancer. In the area of human health, Computer Vision plays a significant role, which reduces the human judgement that gives accurate results. CT scans, X-Ray, and MRI scans are the most reliable and secure. MRI detects every minute objects. Our paper aims to focus on the use of different techniques for the discovery of brain cancer using brain MRI. In this study, we performed pre-processing using the bilateral filter (BF) for removal of the noises that are present in an MR image. This was followed by the binary thresholding and Convolution Neural Network (CNN) segmentation techniques for reliable detection of the tumour region. Training, testing, and validation datasets are used. Based on our machine, we will predict whether the subject has a brain tumour or not. The resultant outcomes will be examined through various performance examined metrics that include accuracy, sensitivity, and specificity. It is desired that the proposed work would exhibit a more exceptional performance over its counterparts.

CHAPTER 1

INTRODUCTION

Medical imaging is the technique and process of creating visual representations of the interior of a body for clinical analysis and medical intervention, as well as visual representation of the function of some organs or tissues. Medical imaging seeks to reveal internal structures hidden by the skin and bones, as well as to diagnose and treat disease. Medical imaging also establishes a database of normal anatomy and physiology to make it possible to identify abnormalities. The medical imaging processing refers to handling images by using the computer. This processing includes many types of techniques and operations such as image gaining, storage, presentation, and communication. This process pursues the disorder identification and management. This process creates a data bank of the regular structure and function of the organs to make it easy to recognize the anomalies. This process includes both organic and radiological imaging which used electromagnetic energies (X-rays and gamma), sonography, magnetic, scopes, and thermal and isotope imaging. There are many other technologies used to record information about the location and function of the body. Those techniques have many limitations compared to those modules which produce images.

An image processing technique is the usage of a computer to manipulate the digital image. This technique has many benefits such as elasticity, adaptability, data storing, and communication. With the growth of different image resizing techniques, the images can be kept efficiently. This technique has many sets of rules to perform in the images synchronously. The 2D and 3D images can be processed in multiple dimensions.