**KALASALINGAM ACAEMY OF RESEARCH AND EDUCATION**

**(Deemed to be University)**

**Anand Nagar, Krishnankoil**

**SCHOOL OF COMPUTING**

**DEPARTMENT OF CSE**

**Circular 05.12.2020**

All the final Year students **(Theory cum Project students )** are instructed to submit their Phase-I Capstone Project report on or before 13.12.2020.

A Sample Report as per ABET Guidelines attached with this notification.

The Guidelines to Prepare the Phase-I Report as Follows:

The following things to be included in your project report

1.Introduction

2.literature review/ Industry Expert Survey

3. Objectives, Scope

4.Project Plan

5. System Analysis

6.Project Deliverables

7.Fundamental Design Knowledge

8. Status of the Project

**Drive link to upload the reports:**

[**https://drive.google.com/drive/u/0/folders/1P5dEjQW0JWk2Ad0QF6Ssb1454Q760hrX**](https://drive.google.com/drive/u/0/folders/1P5dEjQW0JWk2Ad0QF6Ssb1454Q760hrX)

**(File name as your project ID)**

**Instructions for Final Year Capstone Design project Phase-I**

**Guidelines for Project Report Preparation**

All the projects students are requested to follow the guidelines given below

* All the final year projects students are strictly follow the ABET format.
* While preparing the project report, please ensure that percentage of plagiarism should be less than 15%.
* In case of any clarification in preparing the project report, consult with your project guide.

Note

All the Internal and external batches are requested to get verification from project guide and upload the soft copy of project report to project coordinator in the ABET format before 13.12.2020.

All the Internal project guides are requested to verify the project report has been submitted in the prescribed ABET format.

# General Instructions

* The project report should be printed in A4 size.
* Margins to be set: Left: 1.5”, Right: 0.75”, Top: 1’ and Bottom: 1’
* Report should be on single side printing and paragraphs must be fully justified
* The project report should be bound using flexible cover of the thick white art paper.
* The cover and the inside text should be printed in black letters.
* Printing should be done with Font style “Times New Roman” and size 12 and with a uniform line spacing of 1.5.
* Sub-headings shall be printed with Font style “Times New Roman” and size 12 and **bold.**
* Headings may be printed with Font style “Times New Roman” and size 14 and **bold.**
* The word Table indicates any tabulated numerical data in the body of the project report as well as in the appendices.
* All non-verbal materials used in the body of the project work and appendices such as charts, graphs, maps, photographs and diagrams may be designated as figures.

**II. Components of the Project Report:**

The following sequence should be used in arranging the project material and the report should be bound using flexible cover with a thick art paper before submission.

* 1. Cover Page & Title Page
  2. Declaration by the student
  3. Bonafide Certificate by the guide
  4. Acknowledgement
  5. Table of Contents
  6. List of Tables
  7. List of Figures
  8. List of Symbols, Abbreviations and Nomenclature
  9. Abstract
  10. Chapters
  11. Appendices
  12. References

The table and figures shall be introduced in the appropriate places.

**III. Preparation format**

1. **Cover Page & Title Page:** The cover page and the title page should include the Title of the

project work, Name of the Candidate (Registration No.), Department Name, University

Name (and emblem) and Place, Academic Year. (Refer the specimen copy of the Cover page

& Title page of the project report given in Annexure- I)**.**

1. **Declaration by the student:** In the declaration page the student should give affirmation that

the work carried out is original. (Refer the specimen copy of declaration in Annexure – II).

1. **Bonafide Certificate by the Guide:** The Bonafide Certificate given by the guide should be as per the format in Annexure- II. The certificate should have the supervisor’s signature followed by the supervisor’s name, academic designation (not any other responsibilities of administrative nature), department and full address of the institution where the supervisor has guided the student. The term **‘SUPERVISOR’** must be typed in capital letters between the supervisor’s name and academic designation.
2. **Project Completion Certificate:** All external batch students should get the project completion certificate (individually) from the concerned organization should be printed in office letter pad with round seal.
3. **Attendance Certificate:** All external batch students should get the attendance certificate from the concerned organization for the whole project work.
4. **Acknowledgements:** The candidate may give credits and appreciations for all those who helped in the preparation of project.
5. **Table of Contents:** The table of contents should list all material following it as well as any material which precedes it. The title page, declaration and Bonafide Certificate will not find a place among the items listed in the table of contents but the page numbers of which are in lower case Roman letters. One and a half spacing should be adopted for typing the matter under this head. A specimen copy of the Table of Contents of the project report is given in Annexure- IV.
6. **List of Tables:** The list should use exactly the same captions as they appear above the tables in the text. The list should be prepared with 1.5 line spacing.
7. **List of Figures:** The list should use exactly the same captions as they appear below the figures in the text. The list should be prepared with 1.5 line spacing.
8. **List of Symbols, Abbreviations and Nomenclature:** Standard symbols, abbreviations etc. should be used. The list should be prepared with 1.5 line spacing.
9. **Abstract (summary):** Abstract of the report should be of one page (250 words or less) and shall include the purpose of the study; the methodology used and a summary of the major findings, conclusions and recommendations.
10. **Chapters**: This forms the main body of the project.The project may be divided into 3 to 4 parts the first being Introduction and the last being Conclusion. The main text will be divided into several chapters and each chapter may be further divided into several divisions and sub-divisions.

* Each chapter should be given an appropriate title.
* Tables and figures in a chapter should be placed in the immediate vicinity of the reference where they are cited.
* Footnotes should be used sparingly. They should be typed single space and placed directly underneath in the very same page, which refers to the material they annotate.

1. **Appendices:** Appendices are provided to give supplementary information, which is included in the main text may serve as a distraction and cloud the central theme.

* Appendices should be numbered using Arabic numerals, e.g. Appendix 1, Appendix 2, etc.
* Appendices, Tables and References appearing in appendices should be numbered and referred to at appropriate places just as in the case of chapters.
* Appendices shall carry the title of the work reported and the same title shall be made in the contents page also.

1. **List of References** –The listing of references should be typed 2 spaces below the heading “REFERENCES” in alphabetical order in single spacing left – justified. The reference material should be listed in the alphabetical order of the first author. The name of the author/authors should be immediately followed by the year and other details.

A typical illustrative list given below relates to the citation example quoted above.

**REFERENCES**

1. Ariponnammal, S. and Natarajan, S. (1994) ‘Transport Phonomena of Sm Sel – X Asx’, Pramana – Journal of Physics, Vol.42, pp.421-425.
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**Identification of Brain Tumor Using Deep Learning**

**Neural Networks**

**A FINAL YEAR CAPSTONE DESIGN PROJECT**

**(Phase-I)**

###### ***Submitted by***

**S. AKSHYAA (9916004004)**

**R. KIRTHIKAA (9916004063)**

**R.LIMSHA FERNANDO (9916004073)**

***in partial fulfillment for the award of the degree***

***of***

**BACHELOR OF TECHNOLOGY**

IN

**COMPUTER SCIENCE AND ENGINEERING**

****

**SCHOOL OF COMPUTING**

**COMPUTER SCIENCE AND ENGINEERING**

**KALASALINGAM ACADEMY OF RESEARCH**

**AND EDUCATION**

KRISHNANKOIL 626 126

Academic Year 2019-2020

**DECLARATION**

We affirm that the project work titled **“Identification of brain tumor using deep learning neural Networks”** being submitted in partial fulfillment for the award of thedegree of **Bachelor of Technology in Computer Science and Engineering** is the original work carried out by us. It has not formed the part of any other project work submitted for award of any degree or diploma, either in this or any other University.

S. AKSHYAA

9916004002

R.KIRTHIKAA

9916004063

R.LIMSHA FERNANDO

9916004073



**BONAFIDE CERTIFICATE**

Certified that this project report **“Identification of brain tumor using deep learning neural networks”** is the bonafide work of “**S.AKSHYAA, R.KIRTHIKAA, R.LIMSHA FERNANDO”** who carried out the project work under my supervision.

**SUPERVISOR HEAD OF THE DEPARTMENT**

Dr. B.S.Murugan Dr. A. FRANCIS SAVIOUR DEVARAJ

Assistant Professor Professor/Head

Computer Science and Engineering Computer Science and Engineering

Kalasalingam Academy of Research Kalasalingam Academy of Research and and Education and Education

Krishnankoil 626126 Krishnankoil 626126

Submitted for the Project Viva-voce examination held on.......................................

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**Internal Examiner External Examiner**

**ACKNOWLEDGEMENT**

First and foremost, I wish to thank the **Almighty God** for his grace and benediction to complete this Project work successfully. I would like to convey my special thanks from the bottom of my heart to my dear **Parents** and affectionate **Family members** for their honest support for the completion of this Project work.

I express deep sense of gratitude to “Kalvivallal” Thiru. **T. Kalasalingam** B.com., Founder Chairman, “Ilayavallal” **Dr.K.Sridharan** Ph.D., Chancellor, **Dr.S.Shasi Anand**, Ph.D., Vice President (Academic), **Mr.S.Arjun Kalasalingam** M.S., Vice President (Administration) , **Dr.R.Nagaraj**, Vice-Chancellor, **Dr.V.Vasudevan** Ph.D., Registrar , **Dr.P.Deepalakshmi** M.E., Ph.D., Dean (School of Computing) . And also a special thanks to **Dr.** **A. Francis Saviour** **Devaraj .** Head, Department of CSE, Kalasalingam Academy of Research and Education for granting the permission and providing necessary facilities to carry out Project work.

I would like to express my special appreciation and profound thanks to my enthusiastic Project Supervisor **Dr.A.Saravanan**, Assistant Professor/CSEof Kalasalingam Academy of Research and Education [KARE] for his inspiring guidance, constant encouragement with my work during all stages. I am extremely glad that I had a chance to do my Project under my Guide, who truly practices and appreciates deep thinking. I will be forever indebted to my Guide for all the time he has spent with me in discussions. And during the most difficult times when writing this report, he gave me the moral support and the freedom I needed to move on.

Besides my Project guide, I would like to thank the rest of Class committee members and all faculty members and Non-Teaching staff for their insightful comments and encouragement. Finally, but by no means least, thanks go to all my school and college teachers, well wishers, friends for almost unbelievable support.

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**School of Computing**

**Department of Computer Science and Engineering**

**Project Summary**

|  |  |  |
| --- | --- | --- |
| Project Title | Identification of Brain Tumor Using Deep Learning  Neural Networks | |
| Project Team Members (Name with Register No) | 1. S. AKSHYAA (9916004004) 2. R. KIRTHIKAA (9915004063) 3. R.LIMSHA FERNANDO (9815004073) | |
| Guide Name/Designation | Dr. A.Saravanan, Assistant Professor, Department of Computer Science and Engineering | |
| Program Concentration Area | Medical Image Processing | |
| Technical Requirements | MATLAB Simulink tool is used by the developer to complete the project. | |
| Engineering standards and realistic constraints in these areas: (Refer Appendix in page 4 of this doc.) | | |
| **Area** | **Codes & Standards / Realistic Constraints** | **Tick ✓** |
| Economic |  |  |
| Environmental |  |  |
| Social |  |  |
| Ethical |  |  |
| Health and Safety | This project is mainly used to support the radiologist for better identification of tumor using neural networks | **✓** |
| Manufacturability |  |  |
| Sustainability |  |  |

**Realistic Constraints:**

**Health and Safety:**

In the research of medical, various segmentation methods have been proposed to identify the lesions in the beginning stage to save the millions of human being. Still it is challenging for find out the complex tumors present in the MR brain image. Deep learning neural networks is used to analyze the various complex tumors in deeply. The main focus of this project is to locate the various tumors present in the magnetic resonance (MR) brain image using deep learning neural networks. Because of multifaceted structure of brain, better examination and study is required by a radiologist to identify the various tumors. With the support of neural networks identification of the various tumors is effectively performed. These processes support the radiologist extensively to perform better diagnosis identifying the various types of tumors in the early stages.

**Engineering standards:**

This project is based on IEEE 3333.2.1-2015 –Medical modeling and visualization

This standard focuses on the project demands arising when scientific results in the field of medical visualization are applied for the construction of a software system. It is targeted to aid the clinical work of medical professionals. This standard includes visualization techniques by the automated medical shape detection and reconstruction of three-dimensional (3D) models from two-dimensional (2D) medical images. When the MR image is given as input, automatically the tumors and tissue portion will be demarcated separately. Finally the region of lesions are segmented by the optimization techniques are compared with the gold standard image obtained by the radiologist to check the efficiency of the suggested methodologies and the segmented results can be reconstructed for further analysis to get better visualization of tumors.

**ABSTRACT**

Locating the brain tumor is the tough task in the field of medical. In this research work, an Convolutional Neural Network (CNN) is developed based on auto context on the global and local image features of two dimensional patches with different sizes. Different types of modals are considered:1) A voxel wise technique derived from two dimensional pathways with different directions(coronal, sagittal and axial) and also used three dimensional image without using expensive convolution networks:2)A convolution network that has been fully automated based on the U-net architecture. To locate the boundaries of tumor in the brain and other regions posterior probability maps is used via through the networks are used as context information and compared with the original image.

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**LIST OF ABBREVIATIONS**

|  |  |
| --- | --- |
| **Abbreviation** | **Full form** |
| **CNN** | Convolutional Neural Network |
| **ROBEX** | Robust Learning Based Brain Extraction |
| **BET** | Brain Extraction Tool |
| **HWA** | Hybrid Watershed Algorithm |