

## Web App Version 0.1.14

Home Page. Uploading a Mild Demented brain MRI image. Sending it to our Deep Learning Model.

[Home](#) [Paper Details](#) [Model Details](#) [Grad-CAM Visualizations](#) [Alzheimer's Stages Descriptions](#)

### Upload MRI Image for Alzheimer's Prediction

Choose File

MD\_OAS1\_0052\_MR1\_mpr-4\_101.jpg

Upload

#### About This Project

This web application is an ongoing project under development for detecting early stages of Alzheimer's Disease. The results provided by the tool are not 100% accurate and should not be used as a sole basis for any medical diagnosis.

This application is designed for research purposes only and was solely developed by Mohammad Rafsan at The University of Texas Rio Grande Valley. All rights reserved © 2024.

**Ethical Consideration:** The use of this tool is intended for educational and research purposes. Users are advised to consult with healthcare professionals for any medical diagnosis or treatment decisions. Please respect privacy and ethical guidelines when using or sharing output from this tool.

Our Deep Learning model result or the prediction is also Mild Demented, which is true.

[Home](#) [Paper Details](#) [Model Details](#) [Grad-CAM Visualizations](#) [Alzheimer's Stages Descriptions](#)

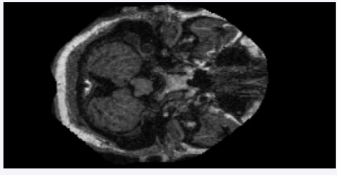
### Upload MRI Image for Alzheimer's Prediction

Choose File

No file chosen

Upload

#### Uploaded Image:



#### Prediction: Mild Demented

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Paper Details Page.

[Home](#)[Paper Details](#)[Model Details](#)[Grad-CAM Visualizations](#)[Alzheimer's Stages Descriptions](#)

## Deep Learning for Early Alzheimer Disease Detection with MRI Scans

### Overview

This project focuses on the application of deep learning models to enhance the early detection of Alzheimer's Disease (AD) using MRI scans. AD is a progressive neurodegenerative disorder that predominantly affects individuals over 40, leading to significant cognitive decline. Early diagnosis is crucial for effective disease management and treatment planning.

### Objectives

### Methodology

### Results

### Conclusion

This research demonstrates the efficacy of deep learning models in enhancing the early detection of Alzheimer's Disease through MRI scans. By addressing data imbalance and optimizing model architectures, the study contributes significantly to the development of AI-driven diagnostic tools in neurology.

### Future Work

The project suggests further research to refine these models and explore their applications in broader medical imaging contexts, aiming to improve diagnostic accuracy and patient outcomes in neurodegenerative disease management.

### Access to Code

### References

Model Details Page.

[Home](#)[Paper Details](#)[Model Details](#)[Grad-CAM Visualizations](#)[Alzheimer's Stages Descriptions](#)

## BayesianCNN Model Details

### Key Features

### Implementation and Results

### CNN Model Description

### U-net Model Description

## Grad-CAM Visualizations Page.

[Home](#) [Paper Details](#) [Model Details](#) [Grad-CAM Visualizations](#) [Alzheimer's Stages Descriptions](#)

### Grad-CAM Visualizations

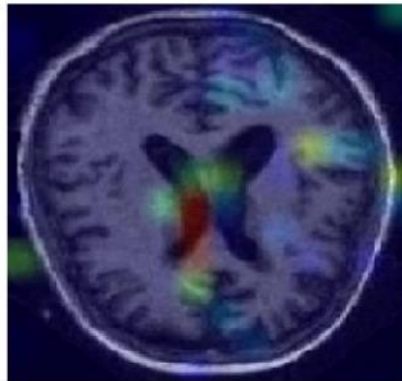
#### Color Coding in Grad-CAM Visualizations

#### Examples of Grad-CAM Visualizations

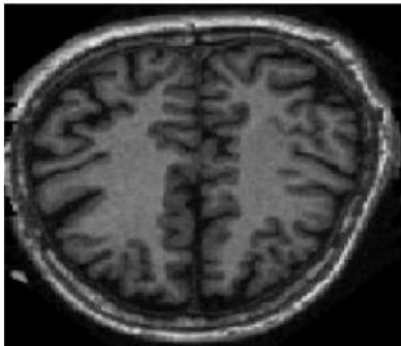
##### BayesianCNN Grad-CAM Visualization



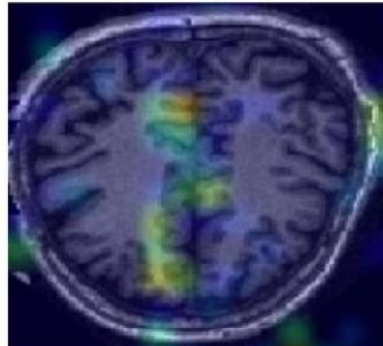
Original Image MOD



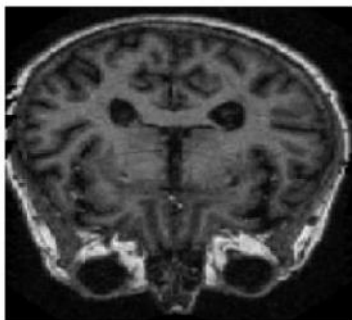
Grad-CAM Image MOD



Original Image VMD



Grad-CAM Image VMD



Original Image NOD



Grad-CAM Image NOD

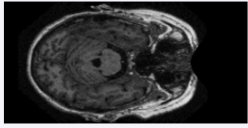
# Alzheimer's Stages Descriptions Page.

[Home](#) [Paper Details](#) [Model Details](#) [Grad-CAM Visualizations](#) [Alzheimer's Stages Descriptions](#)

## Stages of Alzheimer's

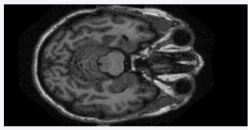
### 1. Non Demented

Individuals classified as Non Demented show no signs of dementia. Their cognitive functions, including memory, orientation, and judgment, remain intact, resulting in a CDR score of 0. They demonstrate normal daily functioning without any noticeable decline in various cognitive domains.



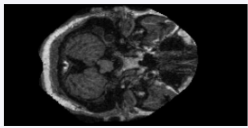
### 2. Very Mild Dementia

People with Very Mild Dementia exhibit very subtle cognitive difficulties, which may not significantly interfere with their daily activities. This stage, corresponding to a CDR score of 0.5, often includes slight memory lapses and minor disorientation that may go unnoticed in casual interactions but are detectable through careful clinical assessment.



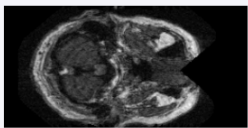
### 3. Mild Dementia

Mild Dementia involves more noticeable memory issues and a decline in cognitive functions. Individuals with a CDR score of 1 may experience challenges in navigating new environments, making complex decisions, and managing personal affairs, indicating a clear deviation from their previous level of functioning.



### 4. Moderate Dementia

This stage represents a moderate to severe level of cognitive decline, with a CDR score ranging from 2 to 3. Individuals require substantial assistance with daily activities. They show significant impairments in memory, orientation, judgment, and personal care, impacting their ability to live independently.



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