Alzheimer's Diagnosis using Brain Scan Data

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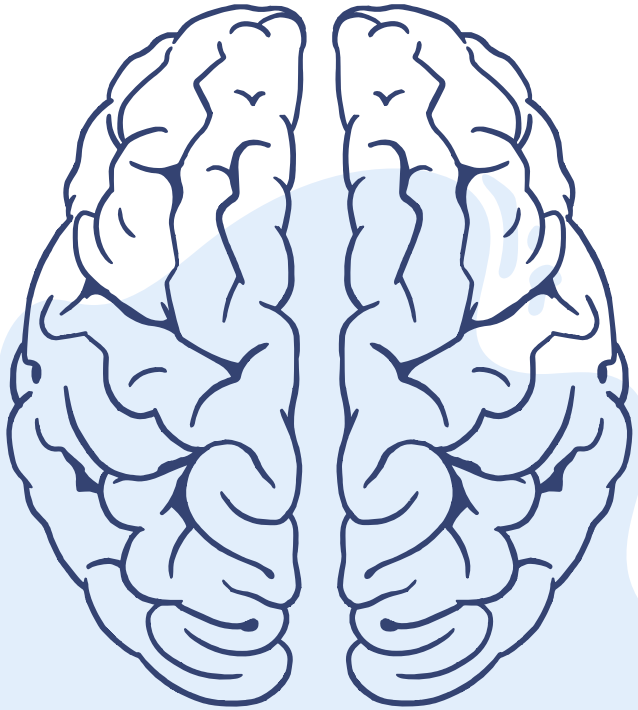


Whoa!

By using MRI scans of patient's brains, we have developed a machine learning algorithm that should tell us which patients may be experiencing memory loss.

TABLE OF CONTENTS

01 **INTRODUCTION**
How we came about our data and how we chose our topic of interest.

02 **ANALYSIS**
Break down of the data and the direction we took.

03 **PRESENTATION**
Demonstration of the model.

04 **CONCLUSION**
Closing remarks, Future work , and Questions

“Being the richest man in the cemetery doesn’t matter to me. Going to bed at night saying we’ve done something wonderful, that’s what matters to me. ”

—Steve Jobs

01

Introduction

- It all started with an idea that lead to a Google search
- We then found our MRI data on the USC Image & Data Archive
- We then began research on what others had done before
- Once we had an idea what we what to do we dove into the data.

02

Analysis

Data

Our data consists of 420 MRI scans of patients who have been seen by a doctor concerning possible memory loss. Theses scans came in a nii file with three possible diagnosis:

- CN - Normal Control or Functioning
- MCI - Mild Cognitive Impairment
- AD - Alzheimer’s Disease

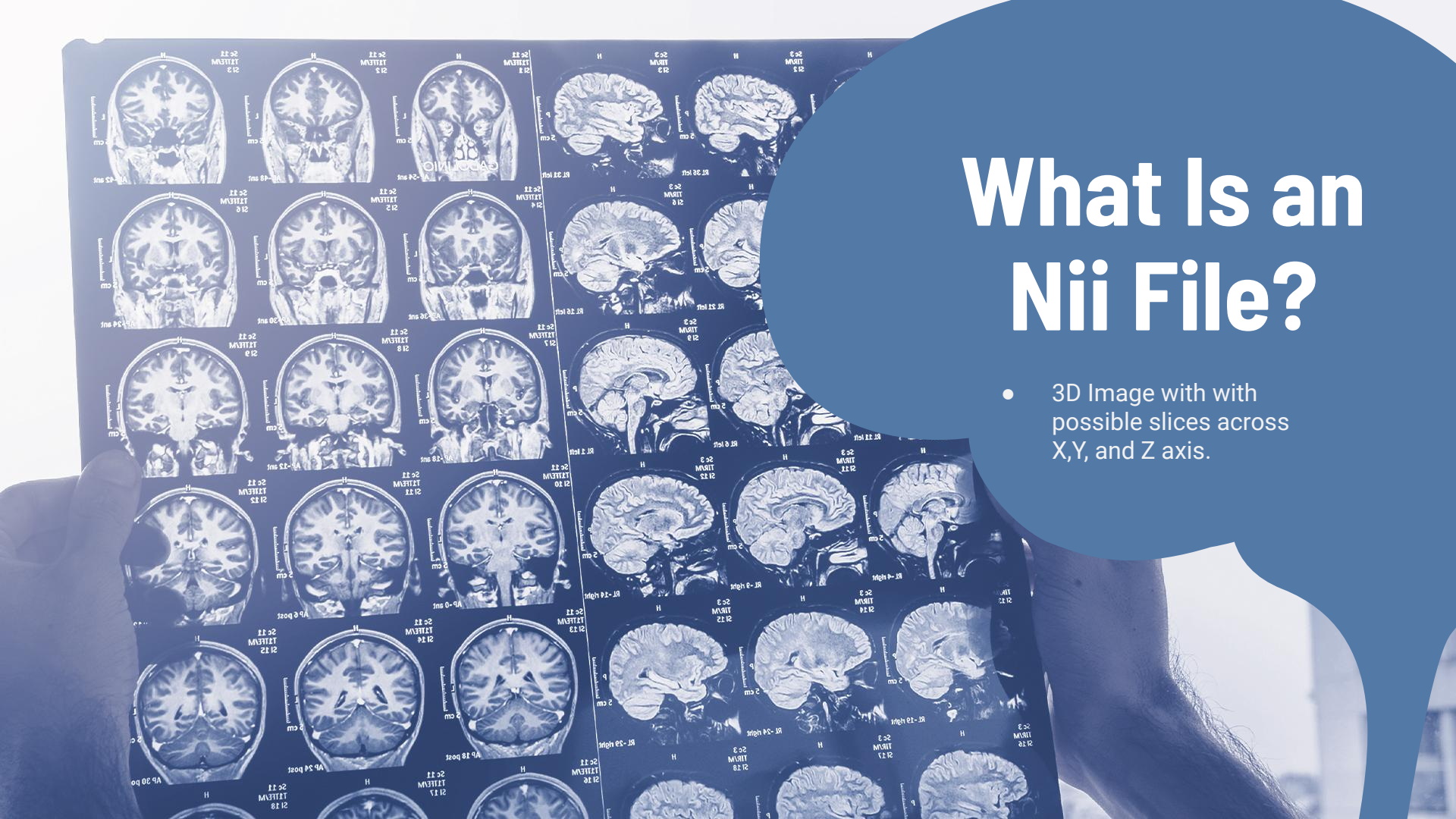
By Using these three categories we were able to train our machine to know what these images were supposed to look like.

Division of Our Data

CN

MCI & AD

In order to simplify our model, instead of using three groups, we decided to use only two. We left CN in a group alone and paired MCI with AD.



What Is an Nii File?

- 3D Image with with possible slices across X,Y, and Z axis.

Steps of Data Preparation

01

Divided Data by making a Binary Classifier

02

Defined our Nii files as arrays ranging from 0 - 1776

03

We then chose to slice across the Z-axis

04

We standardized our image sizes

05

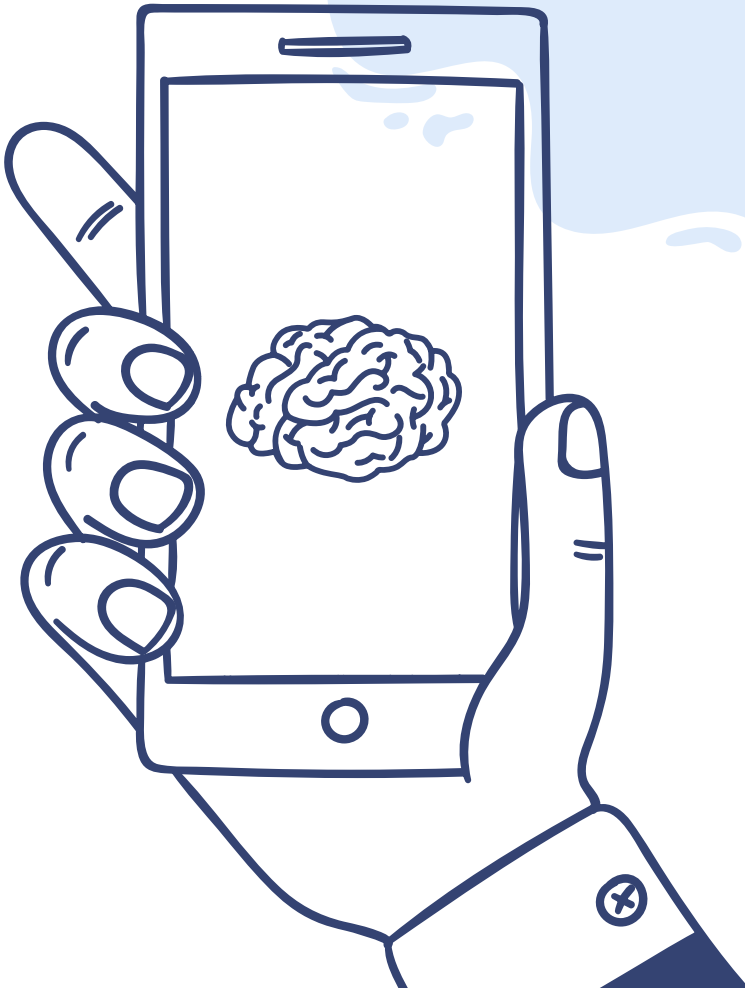
Use a Convolutional Neural Network as our Machine

06

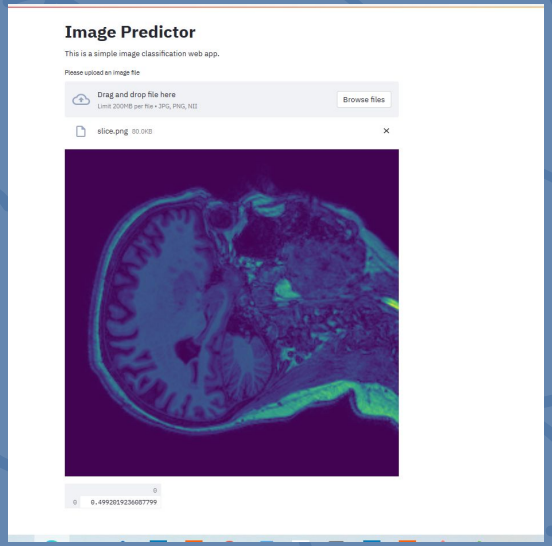
Deployed model by using streamlit

03

Presentation

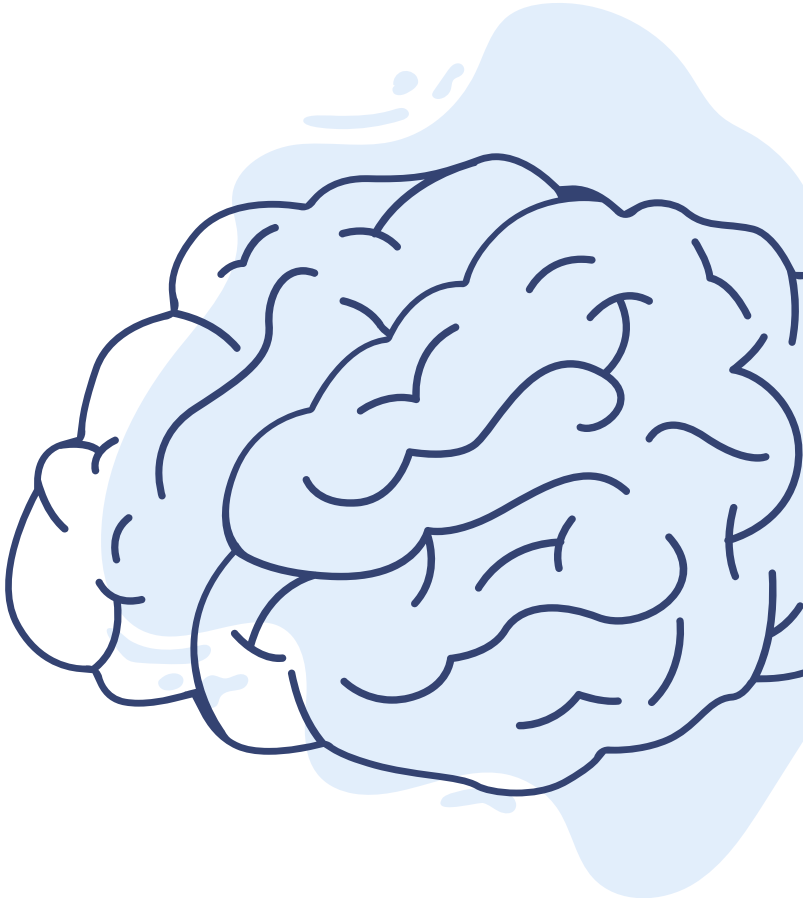


Check Out Our APP!



04

Conclusion



Our Product

We were able to explore slices of an MRI images and determine AD Cases.

Overfit model
Accuracy Score : 72%

TIME SPENT: <1 Week

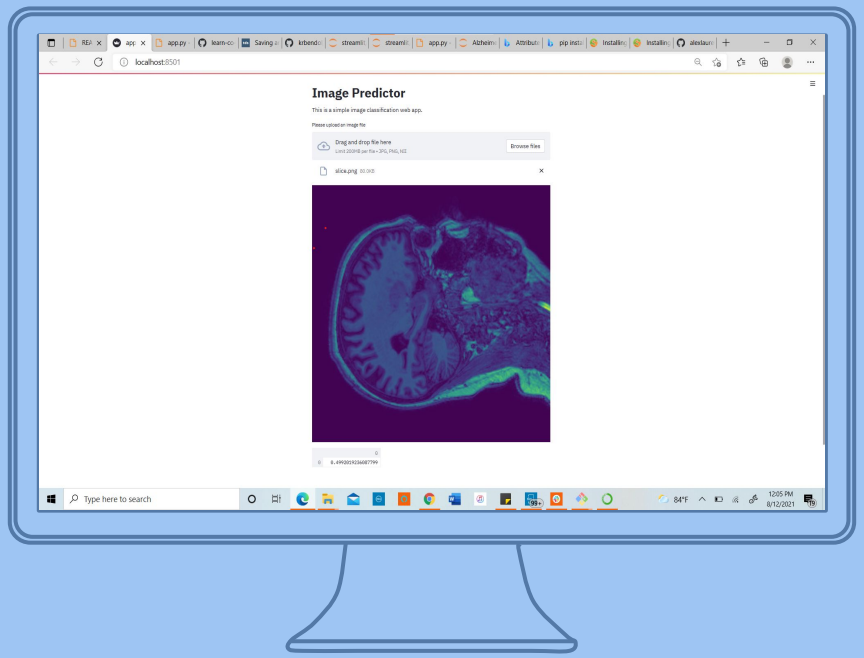
Future Work

We want to be able to examine the entire nii file which we believe would lead to better results.

Reduce overfitting
Hopeful Accuracy: >85%

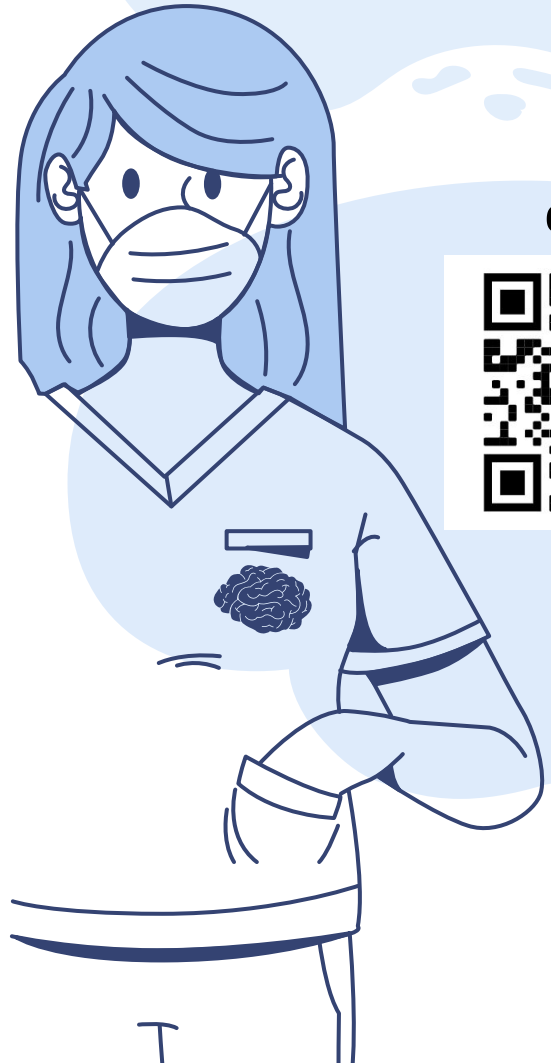
EST. TIME : 3 WEEKS

Expanding Our Product



DESKTOP SOFTWARE

By creating a desktop software, we would be able to market our product to Doctors offices to use in house to assist with their own analysis.



GitHub

THANKS!

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