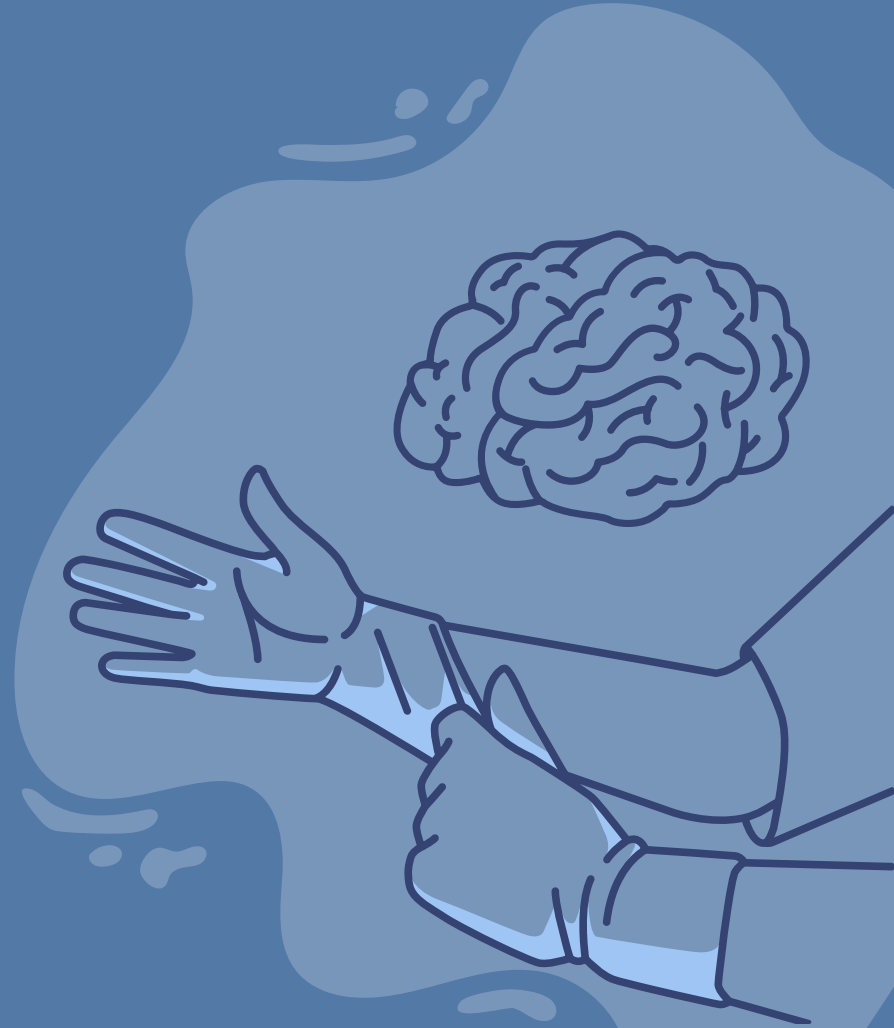
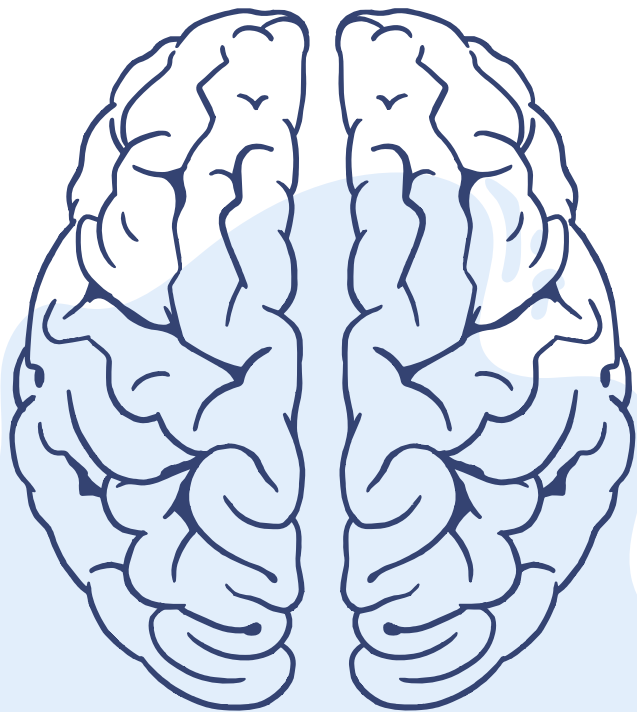


# Alzheimer's Diagnosis using Brain Scan Data

Cameron DeArman, Andrew Calkins, and Kamryn Bendolph





# 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.

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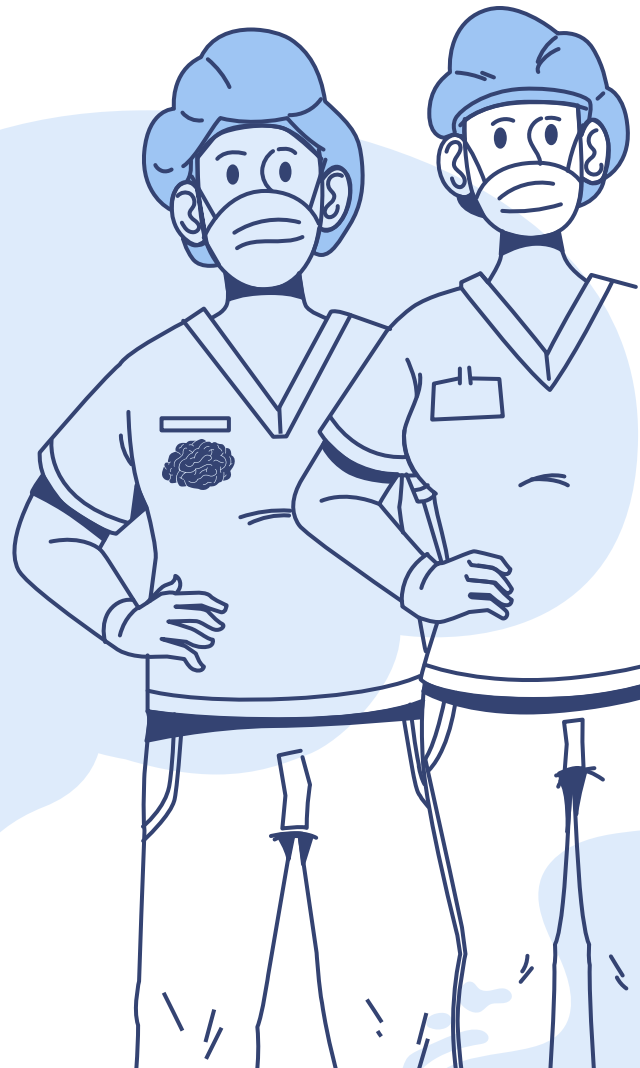


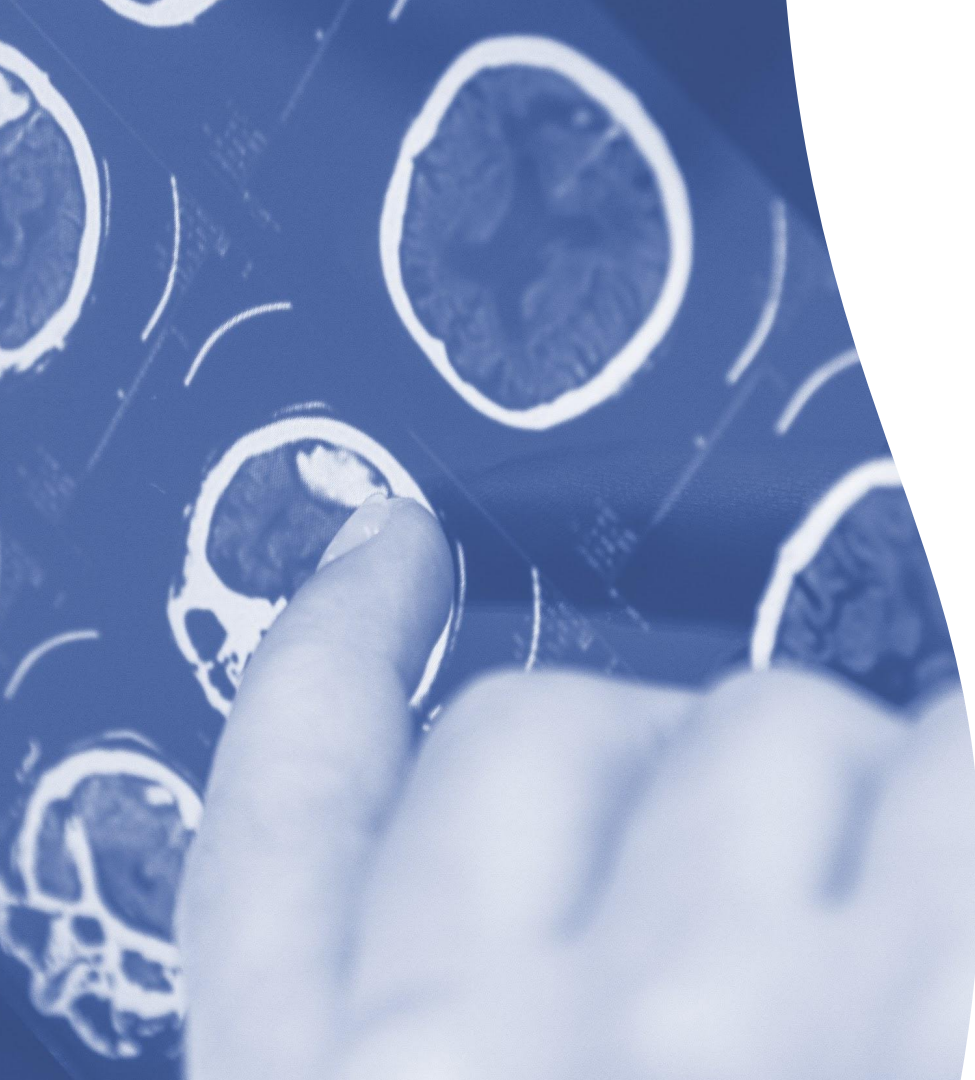
“Being the richest man in the cemetery doesn’t matter to me. Going to bed at night saying we’ve done something wonderful, that’s what matters to me. ”

—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. These 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.

A hand is holding a large sheet of medical MRI scans. The scans are arranged in a grid, showing various cross-sections of a brain. The scans are in grayscale, with some areas highlighted in blue. The background is a solid blue color. On the right side, there is a large blue circle containing white text. The text reads "What Is an Nii File?". Below the text, there is a bullet point that says "3D Image with with possible slices across X,Y, and Z axis." The overall image has a professional, medical feel.

# 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

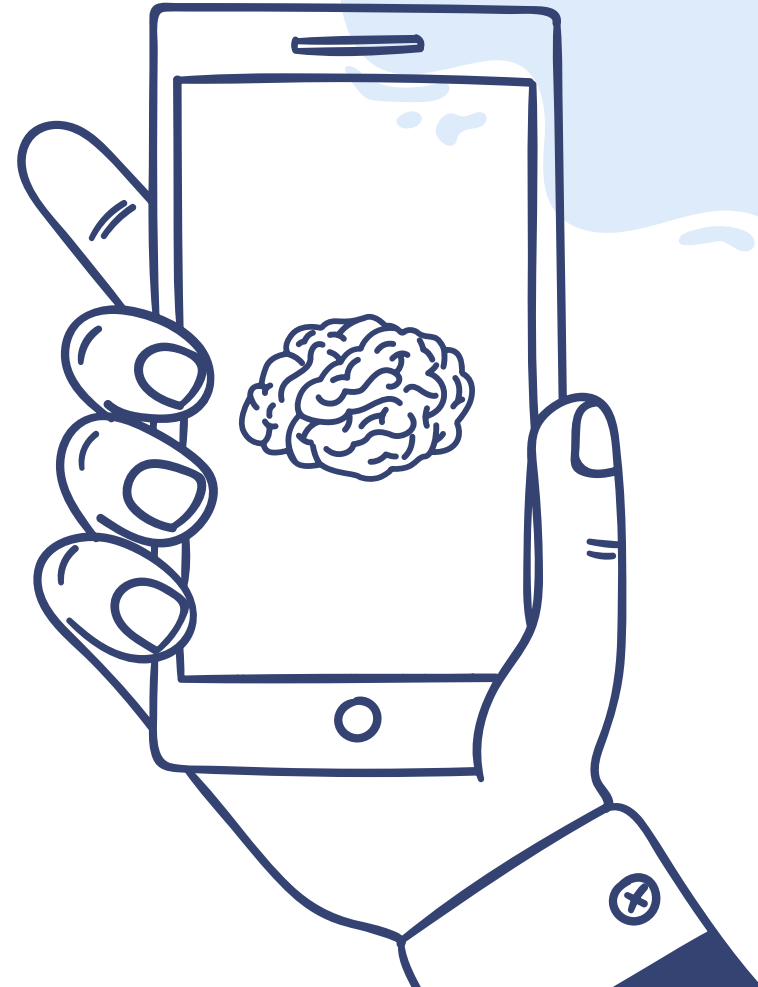
Use a Convolutional Neural Network as our Machine

06

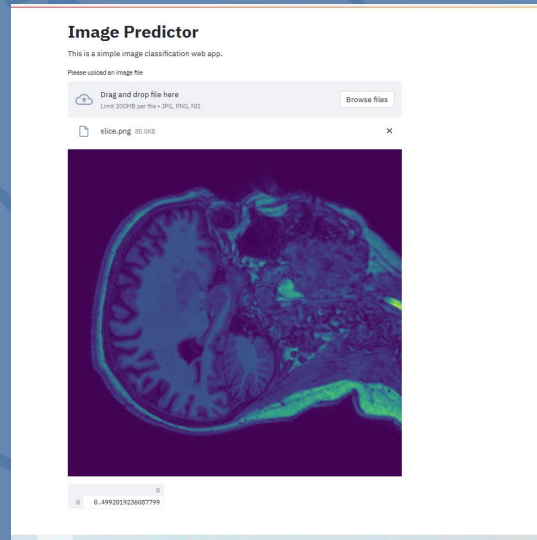
Deployed model by using streamlit

03

# Presentation

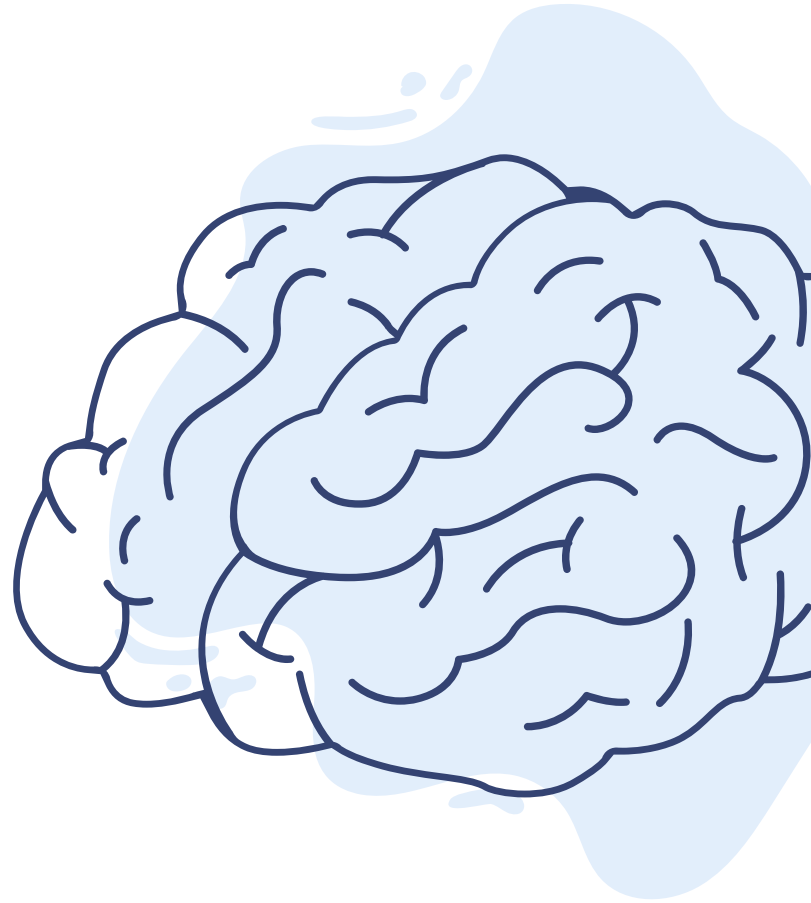


# Check Out Our APP!



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

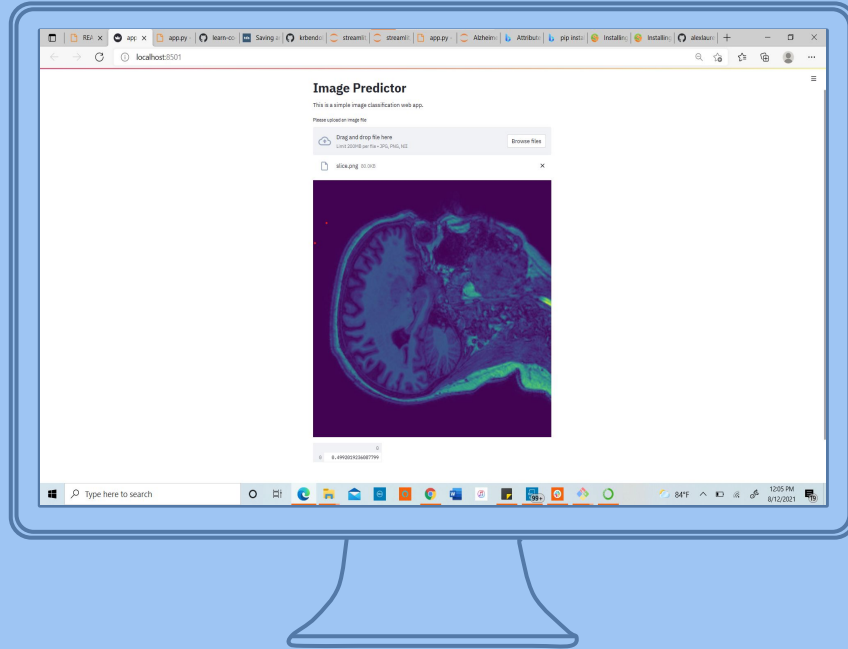
We want to be able to examine the entire nii file which we believe would lead to better results.

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.





# THANKS!



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