Predicting Alzheimer's stages using CNN

Hunter Owen

OVERVIEW

1. Background

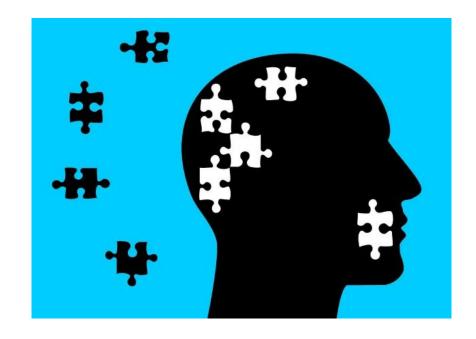
- a. More than 5 million Americans
- b. One in 10 people age 65 and older

2. Goal

- a. Model that helps diagnose Alzheimer's
- b. Uses MRI photos

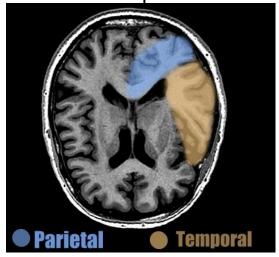
3. Data

a. Dataset from Kaggle

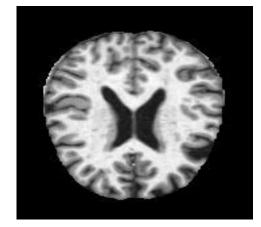


Classes

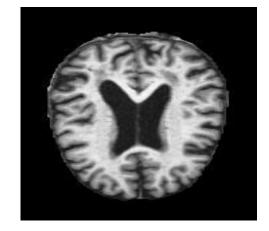
Areas of Focus



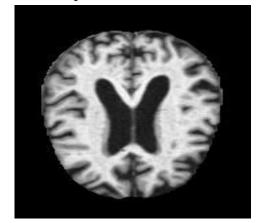
Normal Brain



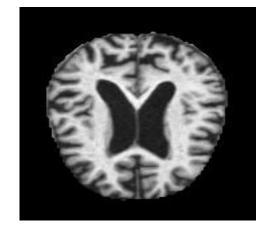
Mild Alzheimer's



Very Mild Alzheimer's

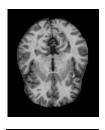


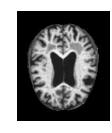
Moderate Alzheimer's

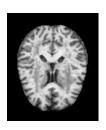


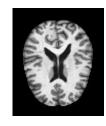
Classes

Normal Brain

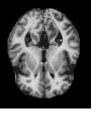




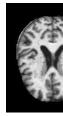


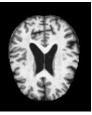


Very Mild Alzheimer's

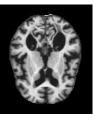


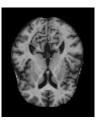




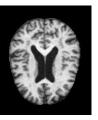


Mild Alzheimer's

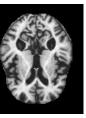


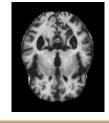


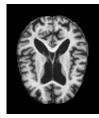




Moderate Alzheimer's

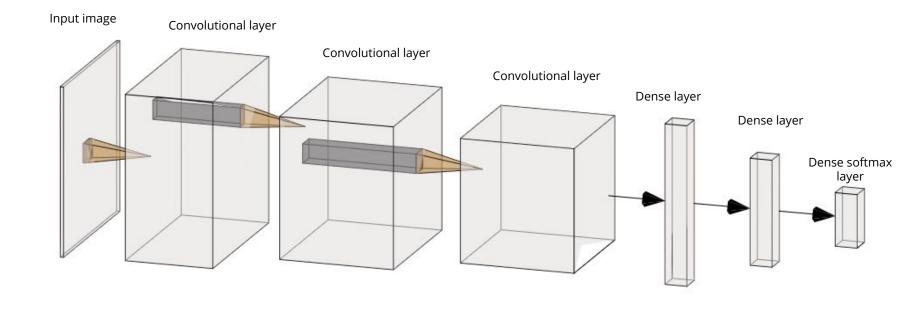




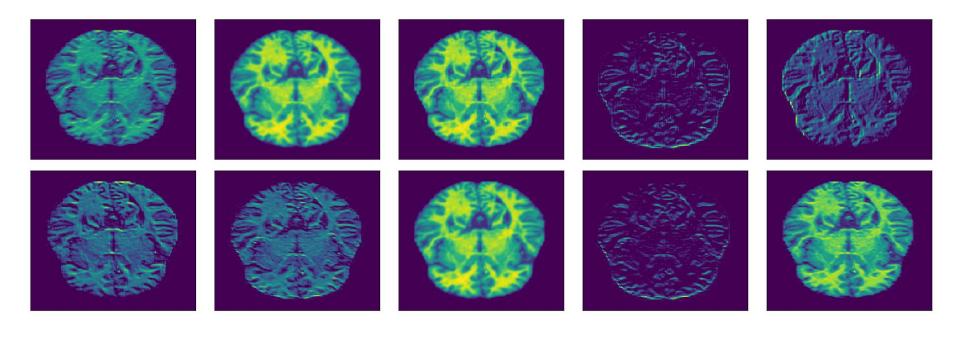




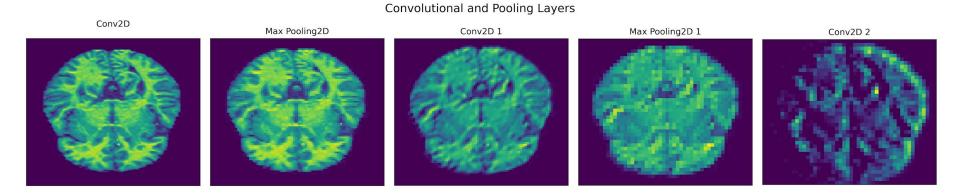
CNN Architecture



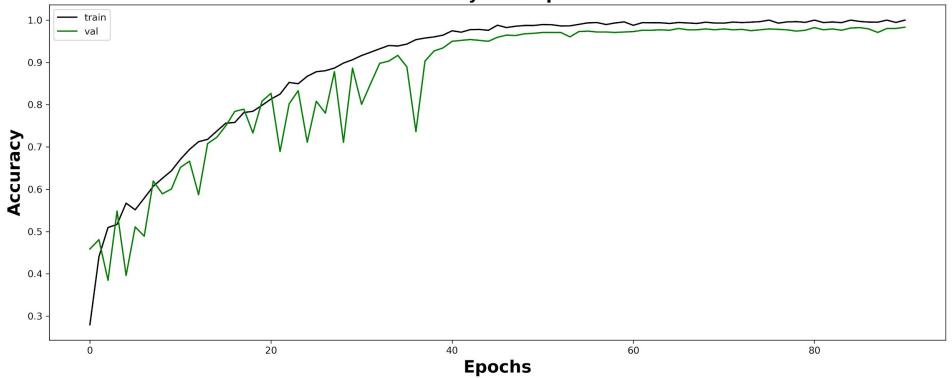
Filters on first layer



CNN layers







Test Confusion Matrix - 1.0 0 0.015 0.044 0.94 Mild -- 0.8 0 0 0 Moderate -- 0.6 - 0.4 0.0021 0 0.96 0.033 None -- 0.2 0.006 0 0.009 0.99 Very Mild -- 0.0 Moderate Very Mild Mild None **Predicted**

Incorrect Predictions

Probabilities of wrong predictions p(Moderate) = 0.0000p(Normal) = 0.0000Mild p(Mild) = 0.2980p(Very Mild) = 0.7020Mild p(Mild) = 0.0165p(Moderate) = 0.0000p(Normal) = 0.0001p(Very Mild) = 0.983425 p(Mild) = 0.0003p(Moderate) = 0.0000p(Normal) = 0.4547p(Very Mild) = 0.5450Normal Mild p(Mild) = 0.0165p(Moderate) = 0.0000p(Normal) = 0.0001p(Very Mild) = 0.9834

150 200

150

150

150

Next Steps

-Updating online application with Flask



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