

Kristin Levine – Capstone Spring 2022

Weekly Progress

Week of April 25

- Refined papers and presentations
- Uploaded code and papers to GitHub

Week of April 18

- Fine-tuned models
- Created tables of results
- Started papers

Week of April 11

- Created different dataset – original, flipped, shifted
- Ensembled models together

Week of April 4

- Despite all changes – no improvement in test set
- Created model using Kaggle dataset
- Tried to create dataset from original MRI images using images that seemed similar to the ones in the Kaggle dataset

Week of March 28

- Tried adding more data
- Tried changing loss, LR, batch size, different way of normalizing data
- Tried adding genetic and age data
- Tried 3D CNN model

Week of March 21

- Created preliminary presentation

Week of March 14 – spring break

Week of March 7

- Try basic CNN from Midterm code
- Create table of three pretrained methods and the basic CNN model
- Google slides presentation
- Draft of paper
- Come up with way to combine models

Week of February 28

- Download the rest of data (code to automate??) – wrote code to automate and downloaded the rest of data

- Train models – adjust parameters ****fun part**** – trained the models, but they are overfitting
- Add the “per patient” code

Week of February 21

- Downloaded more data – 6 files – > 60+
- Preprocessed – 3 slides from each image
- Saved in train/test sets and target folders
- Got all code running
 - ResNet50
 - Xception
 - VGG16
 - Combined with Random Forest

Week of February 14

- Looking at ADNI1 Complete 3 Year 1.5 T Dataset
- 2182 images/44.16 GB
- Metadata csv file: multiple visits
 - First visit for each person
 - 485 rows – some people had multiple images on first visit
 - Drop duplicates – gives us 382 subjects
 - AD: 99
 - MCI: 148
 - CN: 135
- Preprocessing
 - Loading labels from csv files
 - Getting the shape of each file (256, 256, 180)
 - Taking the middle slice from each orientation (: , : , 90)
 - Three “images” for each patient

Week of February 7

- Got access to ADNI data!!
- Explore dataset
- Figure out how to take slices

Week of January 31 **Preprocessing******

- Benchmarking other Kaggle projects
- Work through as much of [MRI Preprocessing Info sheet](#) as possible
- Follow up with ADNI data
- Test code on Biowulf

Week of January 24 **Learning about MRIs******

- Look at other studies – see how they preprocessed MRI images for CNN networks
- Applied for access to full ADNI data
- Email Amir about transformers lecture notes
- Spoke with Hampton (from work) about project
- Figured out how to run notebooks on Biowulf (computer at NIH)
- Created list of Resources to Explore about MRI Preprocessing

Week of January 17, 2022 **Learning about MRIs**

- Finalized proposal
- Experimented with MRI files DICOM and NIFTI
 - Figured out how to read
 - Figured out how to take slices and save
- Got access to MRI images
 - AIBL (Australian Imaging, Biomarker & Lifestyle Flagship Study of Ageing)
 - Read those files
- Talked to Anant about folder he shared/preprocessing pipeline