Opening:

- Mental problems exist since forever, diagnoses that identify them early is very crucial to their growth and development.
- The growth of technology and has enable us to make program models that do complex math to solve many problems that costs many human hours to solve in a fragment of that time. The model can take in input as data and output as what we want to predict. The model can also evolve to be better at what we want it to predict. It's called machine learning.
- I will be using that technology to solve a question everyone has: How to identify autism using the brain scan performed on a person with various other basic information like age and gender?

The problem:

- Autism biomarker: Given structural brain connectivity of autistic children, I need to come up with a classifier that distinguishes Autistic kids from the healthy controls. I could also come up with some way to score how severe is the Autism.
- I have the data as text files and metadata file. The text file contains 86x86 numbers. I assumed that this is the length of 86 brain regions in relation to each other. The metadata contains labels of the raw data. It tells me the brain scan's person's gender, age and whether they have autism or not.
- I need to come up with a model that takes input of an 86x86 tensor and output 0 or 1, with 0 being normal and 1 being autistic.
- I need to find out the correlation between brain scan, age, gender, and autist or not.

Solution:

- I will be using CHARM: Structural connectivity data, contains data from 11 different sites, includes ~1200 subjects (patients and controls in each site), biggest chunk of data is ~400 subjects, each subject has only 1 brain image.
- I think I would be using CNN model to takes in 86x86 input and output a percentage, with the number being closer to 1 being autism and closer to 0 otherwise.
- I need to convert the text file into tensor size 86x86.
- I will try to separate male/female to see if there is any correlation between gender and autism, I will also try to put age in input data and compare them to non-age data.
- The model will be made in reference to the paper: Convolutional Neural Networks for the Prediction of ASD and Biomarker Identification (Okeke). The model will be made using python.
- I will be using google colab to train the model as they have the GPU needed to do stuff.

Bibliography

Okeke, T. K. (n.d.). Convolutional Neural Networks for the Prediction of ASD.