**Chuck Tucker**

**Capstone Project #1: Initial Ideas**

1. **Analysis of brain images from the Alzheimer’s Disease Neuroimaging Initiative (ADNI)**

Problem:

It takes time and expertise to analyze a brain scan and make an Alzheimer’s diagnosis. Early diagnosis is important for treating any disease, so any method that is able to detect Alzheimer’s quickly and early (with few signs) would be highly beneficial.

Data Source:

I have applied for access to the ADNI dataset, which is publicly available through their [website](http://adni.loni.usc.edu/data-samples/access-data/).

1. **Analysis of Magic the Gathering card sets**

Problem:

Any business would like information about the value of their products including value at a future date, finding undervalued items, finding what attributes of a product make it more valuable. Being able to digest a large dataset to provide these insights would be valuable for many product or service based companies.

Data Source:

Magic the Gathering card set data. This dataset has already been obtained by a friend of mine who teaches statistics and data science classes at Penn State University.

1. **Analysis of Stanley Medical Research Institute online genomics database (SMRIDB)**

Problem:

Being able to predict increased risk of brain disease based on genetics testing could provide patients with the opportunity to adapt behaviors to reduce the risk of disease or to mitigate symptoms.

Data Source:

The SMRIDB data is posted online at this [website.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1489945/) The data include gene expression summaries, patient demographics, disease subclasses, regulated biological pathways, and functional classifications. The diseases examined are schizophrenia, bipolar disorder, and major depression.