Possible Topics for Capstone Project:

1. Natural Language Processing:

Problem: In inpatient medical care, some inpatients either do not get or are too late in getting psychiatric consultation.

Solution: Use natural language processing to determine if there are key words in physician notes that rank the degree that an inpatient requires immediate psychiatric consultation.

* 1. Published Papers:

*Translational Psychiatry* **volume 6**, page e921 (2016)

http://bmjopen.bmj.com/content/7/1/e012012

1. Computer Vision:

Problem: Many radiologists offer various interpretations on breast imaging radiographs which are inconsistent and can be erroneous and subsequently lead to unnecessary biopsies.

Solution: Analyze a random sample of ultrasound mammograms to provide more accurate diagnostic interpretations in order to identify factors that leads to false positive biopsy follow-ups.

1. Published Papers:

<https://www.spiedigitallibrary.org/ebooks/PM/Multimodality-Breast-Imaging-Diagnosis-and-Treatment/Chapter13/Computer-Vision-Theoretic-Approach-for-Breast-Cancer-Diagnosis--Commonly/10.1117/3.1000499.ch13>

https://arxiv.org/abs/1703.07047

1. Graphical Information system:

Problem: Psychiatric outcomes are often based on individual characteristics. Most do not take into consideration of spatial demographic data. I’m currently involved with several studies that tracks patient location throughout the US. It remains unclear whether or not there is a clustering pattern related to particular psychiatric outcomes.

Solution: Use GIS spatial analysis to identify clusters of depressed and/or relapse patients in the US.

1. Published Papers:

[Acta Inform Med](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4315644/). 2014 Dec; 22(6): 402–405.