Summary – PhD RPE

Presenter: Sanya Singh

Advisor: Prof. Kenneth Chiu

Title: Biomedical AI in Healthcare

Objective:

The objective was to create awareness regarding issues plaguing medical data in AI healthcare and base research motivated by these problems. The research revolved around detecting IVH in medical data using 1-D Convolutional Neural Networks.

One of the major issues in this RPE was that there were no sources cited in the related work section that preceded the current work. Some references were indeed added at the end of the slides, but no one could figure out what those references were and did not seem thorough. Also, the related work section had little relevance to the current work, or that relationship was not clearly stated.

Proposed Work:

The speaker explained where deep learning is currently being used for medical AI. Some of the fields included were (**no references cited**):

- Radiology
- Pathology
- Gastro
- Ophthalmology

Then the speaker talked about implementation challenges like data limitations, regulatory approval, privacy issues with data management, compared centralized vs federated learning. **(no references cited)**

An overview of guidelines to make AI in healthcare more accountable was presented. Following are some requirements: - **(no references cited)**

1. Need for developing a useful solution
   - Clinical relevance
   - Harmonization of data collection formats
   - Data should be representative

2. Evaluate model readiness
    - No label leakage between train and test
    - Evaluating and reporting model scope
3. Reporting results, thoughtfully
    - Data source, participants, outcomes, predictors
    - Code, packages, and inputs
    - Supporting docs
4. Responsible deployment

Addressed bias in big data and AI for healthcare. (**no references cited)**

- Address bias in source data for AI
- Data driven and algorithmic bias

Current Work:

- explained some terminologies regarding biotechnology

- explained some terminologies regarding deep learning and stats analysis

Research goals:

- detect evidence of IVH

- explained how data has been collected

- PLS-DA classification

- 1-D CNN Classification

- described data pre-processing technique

- could not explain how results are "excellent" even though it was mentioned in the slides