Weekly Work Report 7/19/2024

**This Week: working on** EEG Signals Literature Review **& WMC data extraction**

**WMC**

* The data has been converted into three separate CSV files, organized by session.
* **All\_Subject\_Session\_1\_Scores.csv**
  + Session\_1: 36 rows

**columns**: ['Subject', 'Session', 'OSpan.EditDistanceScore',

      'OSpan.EditDistanceUnit', 'OSpan.EditDistanceLoad',

       'OSpan.PartialScore', 'OSpan.PartialUnit', 'OSpan.PartialLoad',

       'Ospan.AbsoluteScore', 'OSpan.AbsoluteUnit', 'OSpan.AbsoluteLoad',

       'Math.ACC', 'Math.RT\_mean', 'Math.RT\_sd', 'OSpan.Trials',

       'OSpan.MemoryItems', 'SessionDate', 'SessionTime']

* **All\_Subject\_Session\_2\_Scores.csv**
  + Session\_2: 35 rows

**columns**: ['Subject', 'Session', 'RotSpan.EditDistanceScore',

       'RotSpan.EditDistanceUnit', 'RotSpan.EditDistanceLoad',

       'RotSpan.PartialScore', 'RotSpan.PartialUnit', 'RotSpan.PartialLoad',

       'RotSpan.AbsoluteScore', 'RotSpan.AbsoluteUnit', 'RotSpan.AbsoluteLoad',

       'Rotation.ACC', 'Rotation.RT\_mean', 'Rotation.RT\_sd', 'RotSpan.Trials',

       'RotSpan.MemoryItems', 'SessionDate', 'SessionTime']

* **All\_Subject\_Session\_3\_Scores.csv**
  + Session\_3: 35 rows

**columns**: [‘Subject', 'Session', 'SymSpan.EditDistanceScore',

       'SymSpan.EditDistanceUnit', 'SymSpan.EditDistanceLoad',

       'SymSpan.PartialScore', 'SymSpan.PartialUnit', 'SymSpan.PartialLoad',

       'SymSpan.AbsoluteScore', 'SymSpan.AbsoluteUnit', 'SymSpan.AbsoluteLoad',

       'Symmetry.ACC', 'Symmetry.RT\_mean', 'Symmetry.RT\_sd', 'SymSpan.Trials',

       'SymSpan.MemoryItems', 'SessionDate', 'SessionTime']

**EEG Signals Literature Review:**

*Chai, T. Y., & Chai, T. Y. (2015).* ***Classification of Human Emotions from EEG Signals using Statistical Features and Neural Network****.*

A table with numbers and a number of emotions

Description automatically generated with medium confidence

**Model: BACK–PROPAGATION NEURAL NETWORK**

**STATISTICAL FEATURES**

**A table with text on it

Description automatically generatedA table with numbers and text

Description automatically generatedA math equations on a white background

Description automatically generated**

**Result**

*M. K. Ahirwal and M. R. Kose, "****Emotion Recognition System based on EEG signal: A Comparative Study of Different Features and Classifiers****,"*2018 Second International Conference on Computing Methodologies and Communication (ICCMC)*, Erode, India, 2018, pp. 472-476, doi: 10.1109/ICCMC.2018.8488044.*

**A diagram of a positive mood

Description automatically generated with medium confidence**

**Feature Extraction**

* Features are extracted in time domain and frequency domain. Entropy based features are also extracted.

A paper with text and numbers

Description automatically generatedA math equations and formulas

Description automatically generated with medium confidenceA white paper with black text

Description automatically generated

**A math equations and formulas

Description automatically generated with medium confidenceA math equations and formulas

Description automatically generated**

**Model: SVM, Naïve Bayes, NEURAL NETWORK**

**A screenshot of a document

Description automatically generated**

* **Entropy-Based Features:**
  + Entropy-based features achieved the best performance.
* **Comparison of Models for Domain-Based Features:**
  + Among the three models, Neural Networks outperformed the others in domain-based features.

**Next Week:**

* Continue EEG signal processing using Python packages.
* Conduct a literature review on EEG signal processing using EEGLab.
* Perform EEG signal data processing using MATLAB and EEGLab.