

SE 491 WEEKLY REPORT 4
10/03/2024 - 10/10/2024

Group number: sdmay25-30

Project title: *Explainable AI for source code applications*

Client &/Advisor: *Arushi Sharma*

Team Members:

Manjul Balayar
Kellan Bouwman
Sam Frost
Akhilesh Nevatia
Ethan Rogers

Weekly Rotation
Manjul Balayar
Kellan Bouwman
Sam Frost
Ethan Rogers
Akhilesh Nevatia

Weekly Summary

Following our work in the previous week that instantiated each component of the target pipeline, this week was focused on bringing each piece together to give a full demonstration of the pipeline's dataflow. We have followed some standard formatting and practices within languages/projects to create a suitable demo product. This creates a solid foundation for our future improvements and additions to the pipeline algorithms.

○ **Past week accomplishments**

Manjul Balayar:

- Implementing and trying to understand in detail about different clustering metrics such as random index, mutual information, silhouette, etc under our evaluation.
- Looked into further clustering methods like hyperbolic clustering and metrics for it like poincare.

Kellan Bouwman:

- Worked on environment agnostic pip installable version
- Error correction, for pip and package dependencies
- Base package foundation, expansion and well as foundation for documentation
- Readme, for install and set up on different environments

Sam Frost:

- Unit tests for NeuroXCode/src/data
- Fix dependency issues in previous unit tests

Akhilesh Nevatia:

- Rebased and refactored the clustering branch to internal dev
- Went through Agglomerative Clustering, refactored Algorithm to be completely implemented in “SciPy” (solves matching linkage matrix problem)
- Checked for the pip installable NeuroXCode library locally
- Started testing functionality of the library

Ethan Rogers:

- Worked on incorporating multiple layer into the process activations part of the pipeline
- Subsequently also looked into recording the results of multiple datasets in one go
- Looking at datasets past the ‘faux’ testing dataset to understand the practical application past known results
- Created a small test bench for multiple layers/datasets

○ **Pending issues**

Manjul Balayar: N/A

Kellan Bouwman: N/A

Sam Frost: N/A

Akhilesh Nevatia: N/A

Ethan Rogers: N/A

Individual Time Contributions

Name	Hours This Week	Total Hours
Manjul Balayar	6	25
Kellan Bouwman	6	32
Sam Frost	6	24
Akhilesh Nevatia	12	26
Ethan Rogers	6	25

○ **Plans for the upcoming week**

Manjul Balayar:

- Understanding the pipeline and library structure
- Testing different metrics I have implemented
- Making sure evaluation(alignment & metrics) overall functions fine in pipeline

Kellan Bouwman:

- Continuing foundation library structure
- Making sure the pep8 style is followed
- Updating work around pipelines and workflows
- Working on updates to design and library structure and documentation reflective of new requirements.

Sam Frost:

- Unit tests for process_activations, utilities

Akhilesh Nevatia:

- Ideally testing functionality of the Pip Installable Library
- Mainly Focus on checking Clustering Functionality
- Work on further understanding design heuristics of our library
- Assist with updating design and library structure
- If time permits look into hyperbolic clustering and its implementation as an addition to the current clustering algorithms

Ethan Rogers:

- Eventually testing with the more of the pipeline to check functionality
- Take a step back and view the project holistically to see potential design & development routes

Summary of weekly advisor meeting

Although we did not meet with our advisor this week due to scheduling conflicts, some relevant discussions we had were (1) ensuring our project experience is tailored to an engineering senior design project, and (2) a brief team message containing a synopsis of our past week's progress. In regards to (1), we initiated a discussion on the breadth of the project's design component, ensuring that we are able to leave our own creative mark in the project through a design-to-production workflow. One important dynamic that we discussed was the goals of our customer/developer/client relationship.