

AUGUST Reflections

Github Link: <https://github.com/garrrgi/Neuroinformatics>

Goals doc:

<https://docs.google.com/document/d/1nxd9zSTWGwnrcAIXYGy9iuPiyn3DIR9Td6Vrc832U18/edit?usp=sharing>

- **Goal 1:** Reading pdf: Completed till chapter 9 until quiz front he textbook. It is easier to follow the code snippets with prior reading to the book. Though multiple revisions are needed to retain.
- **Goal 2:** Use of generative AI: Have used google mostly to look for code help. AI use has been reduced for coding or understanding text.
- **Goal 3:** Understanding and reading papers: It has become easy to understand terminologies and understand graphs and interpret them.
- **Goal 4:** Code pipeline from scratch: Can code preprocessing to some extent. Still learning for the analysis pipeline.
- **Goal 5:** Critique methodological flaws: able to critique experimental design for datasets for project as a beginner
- **Goal 6:** Updating goals and docs: Able to update but usually a day or two later. The course has been stressful.
- **Goal 7:** Understanding pipeline and methodology: slow at analyzing and interpreting but trying.
- **Wellness goal:** The course requirements are hectic and therefore usually sleeping late in order to keep up with coursework and research work. Will modify the goals to make it more flexible.

Week 1 (Aug 11) -

Read through chapter 1-4. The textbook is very well written and very easy to understand.

Week 2 (Aug 18) -

Read through chapter 5-6. Decided and discussed for the project dataset.

Week 3 (Aug 25) -

Read through chapter 7-9. Came up with project research questions. Went through preprocessing steps in class and it was an easy to understand code. Submitted comments on Preprocessing assignment questions.

Week 4 (Aug 31) -

Quiz week. Able to interpret graphs as seen in the quiz. I need to re-read a few sections of the textbook. Later in the week I realized that project data needs to be processed to understand data structure and then to curate questions more specifically.

Overall reflection:

Goals need revision to make the learning process less hectic leaving space for things to be processed. Reading textbook is fun as it's very well written. The project dataset is to be re-evaluated as there is some issue with how the task design is. I however need to evaluate my goals for the course as I am not able to focus on learning through the course outcomes, rather it is about completing the tasks and goals. I need to assign better weightage to different components and prioritize goals with respect to that.

SEPTEMBER Reflections

- **Goal 1:** Reading pdf: Completed till chapter 11 until discrete fourier transform. It was difficult to read book prior to class this time as topics like dot product were mathematical and hence it is taking some time for me grasp on to them. Reading this month therefore I have kept at a slower pace to understand the concept properly and then move forward with the next concept.
- **Goal 2:** Use of generative AI: Continued using google to look for functions or formulas to apply. Mostly relied on code snippets given in class to modify for project analysis even and hence wrote the entire thing on my own. Have been using AI however to understand what is happening in those code snippets line by line and then implementing them to check the plots or results.
- **Goal 3:** Understanding and reading papers:Continued reading papers related to methodology for project work. Read through papers to understand when to use fft and when to use morlet and what makes it more appropriate in a certain case of stimulus. I have been able to use my understanding from the course to also my research domain while reading and understanding papers that use eeg.
- **Goal 4:** Code pipeline from scratch: I was able to write preprocessing code upto ICA using help from code given by Arunek. There was an initial struggle to understand what is happening during preallocation into matrices and how to reject components manually but figured it out with help of my project partner.
- **Goal 5:** Critique methodological flaws: This month we were focused over analysis in the second half and therefore to understand and be able to critique methodological flaws was applied basically to our own dataset only. I was able to point out errors while interpreting graphs generated by us and also the conditions in which certain analysis is to be performed.
- **Goal 6:** Updating goals and docs: I updated and changed my goals at the beginning of this month. Since it is difficult to keep notes everyday, I find it easier to take notes across weeks and later update the doc at the end of the month together.
- **Goal 7:** Understanding pipeline and methodology: With help from arunek, I have started understanding the pipeline and requirements of how I can change the analysis pipeline as

per requirements of data for efficient analysis. I can create a roadmap in my head now for how to analyze a certain problem statement especially till preprocessing. Need to get concepts clearer for analysis beyond fft still.

- **Wellness goal:** I have maintained a better mental health this month by sleeping on time and putting in consistent small efforts across multiple days rather than doing everything together. However it did go a little haywire towards the end for project preparation but still it was better than last month.

Week 1 (4 sept) -

Quiz discussion. Self grading. Identified points to answer better: more explanatory. I was not there for class on Friday.

Week 2 (12 sept) -

Read through chapter 10 and 11. Difficult chapter. Will have to read more. Take help from youtube videos to understand dot product. Asked help from a friend to understand how dot product works.

<https://www.youtube.com/watch?v=0iNrGpwZwog>

<https://www.youtube.com/watch?v=KuXjwB4LzSA>

<https://www.youtube.com/watch?v=C0sPtQ3wX9o>

Week 3 (19 sept) -

Reread chapters 10-11. Concept regarding dot product better. Project discussion with ozo of next step. Read papers if morlet better or fft. Wrote code of preprocessing until relocation of epochs without help from AI.

Week 4 (26 sept) -

Finished data analysis for project: preprocessing for 10 participants and ERP analysis. Priority as ozo had to leave. Used AI to help with ICA component understanding and resources suggested by arunek later to reject components. Used AI to identify ERP components in the graph and understand graphs that we plotted but for just 1 subject.

Overall reflection:

After changing my goals this month as per my preference, I feel I am able to learn better and focus more on understanding concepts and grasping them quicker. The project component has been very important in practically implementing all concepts without any help, so we have to figure out everything on our own just by reading more. I used youtube and AI to understand a lot of concepts which was another good idea to understand concepts. Towards the end, the month was a little heavy with analysis work for the project but I guess that is the fun part about research where you don't know where to stop and start the next day. We enjoyed ourselves and kept working.

OCTOBER Reflections

- **Goal 1:** Reading pdf: Completed till chapter 12-14 and 32-33 until permutation based statistical analysis. Reading has been slow this month as concepts were difficult and needed some mathematical understanding but picked up pace for quiz 2. BRSM helped understand statistics concept much easier.
- **Goal 2:** Use of generative AI: use AI a little extra to understand concepts related to morlet wavelets and Hilbert transform this time and how Euler's formula is applied. Since I was behind schedule with the class, took help from Ozo during coding a little to understand what was happening during the practical session by Arunek.
- **Goal 3:** Understanding and reading papers: Did not read many papers involving eeg this month as was focusing on completing and understanding book chapters. Will however read more in the coming month as we need to understand and interpret the results we are getting during our project data analysis.
- **Goal 4:** Code pipeline from scratch: This month I was using and understanding code snippets given in class as concepts are a little tough to grasp immediately. Modified morlet wavelet code to apply for project presentation but I guess there is some fault in it so will re read and do it again.
- **Goal 5:** Critique methodological flaws: Was able to critique and understand the project presentations by other groups and interpret graphs. Was able to understand pipelines of code snippets mostly given in class as well.
- **Goal 6:** Updating goals and docs: Kept weekly notes and updated.
- **Goal 7:** Understanding pipeline and methodology: Able to understand and visualize different convolution methods better now. Tried our hands at morlet wavelets after understanding the concept for our dataset. It was not completely correct but still worth it to get a hang of what we were doing.
- **Wellness goal:** Got a good break during diwali so came refreshed for the quiz. Light month with more focus on concept understanding.

Week 1 (7 October) -

Project presentations. Read chapter 12-13. Tried morlet wavelet analysis but need to redo. Incorporate feedback given during presentation for further analysis.

Week 2 (14 october) -

Read through chapter 14 to do class assignment. Was able to follow code but will have reread it in continuation with dot product and morlet chapters after diwali break.

Week 3 (24 october) -

Diwali break

Week 4 (30 october) -

Quiz 2 so reread all the chapters and slides. Much easier to follow and understand now after multiple readings.

Overall reflection:

This month was on a lighter side with diwali break in between. I got time to complete my readings and finish the pending chapters and understand them. Used AI to mainly understand what was happening in code snippets again or understand the plots generated by those codes. Also got feedback for project work in the beginning so towards the end we started discussing about final analysis and statistical methods. Will focus on finishing project analysis now.