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Presentation 2 - GitHub documentation

I. **What did you do?**

A) I edited the initial MIL_Model_Classdiscussion code based on errors and redundancies discussed in class. These edits included expanding the regular expression used to match cases, so that the code now catches all cases, and removing redundant / unnecessary checks in the code.

B) I updated the code for AttnMIL (now HierarchicalAttnMIL), train_model, and model implementation from initial iterations by Annika to account for the new data loader and to use this quarter's multi-stain, hierarchical attention modeling architecture.

II. **How does it help the project?**

These tasks were a combination of cleaning up past quarters' work and implementing this quarter's model approach. The first part of the work assisted in the improved results of Hannah's MIL code last quarter. Then, the second part of my work helped implement this quarter's model idea which is necessary to actually move forward with the project.

III. **Issues faced (if any)**

There were technological challenges such as managing versions of four team members' work simultaneously, Drive mounting struggles and many OS errors, as well as the issue of how long the code takes to run (and thus every attempt was very time-consuming). Additionally, the new data loader upended much of the previous code and thus I found it challenging to implement updated code accordingly.

IV. **Attempts to resolve issues (if any)**

In terms of implementing the architecture, I went to office hours with Noah and spent much time trying to understand the code and consulting DeepSeek.

V. **Issues resolved (if any)**

Previous quarters' issues were resolved (eg. train / test split, redundancies, and incomplete RegEx). Pre-training errors in the model were debugged.

VI. **Next steps**

Next steps for the project include:

(1) Scrutinizing the code more closely and checking for redundancies, etc. (and there were a few redundancies discussed in class that errored when taken out, so we should also inspect those)

(2) Running the new version of the multi-stain MIL model and benchmarking the new version with last quarter's results

(3) Experimenting with removing the stain-level attention layer

(4) Using attention score to experiment with training stratification

VII. **References**

ChatGPT (code assistance)

DeepSeek (code generation, debugging, and assistance)

VIII. Links to the presentation & code

Project 1, Presentation 2 slides link: Presentation 2 - STAT 390
Project 1, Presentation 2 code link:
https://github.com/arvindkrishna87/STAT390_CMIL_Fall2025/blob/main/Code/MIL/multistainarchitecture_23Oct_Paisley.ipynb,
Google Colab file: Updated_Architecture_MIL_Week_2.ipynb