

Presentation 1

- Links to presentation(s) and code(s) on GitHub
- What did you do?
 - I researched different methods of color representation and gained insights from past literature relating to histological imaging. I outlined 2 action plans: (1) transform RGB images into other well-performing color spaces, such as LAB and HSV, and benchmark with MIL model from last quarter; (2) test whether features containing brightness information are important for model training.
- How does it help the project?
 - Improving color representation could improve training data quality, leading to better classification. Brightness information is shown to be helpful in shape detection. By using a color space that decouples brightness from color, our model could potentially have better learning on the distribution of melanocytes.
 - The previous cross-stain model averaged out the RGB channels from three stains. If we found that the brightness channel alone performs well, we can use only the brightness channel for each stain, so that each stain has its own dimension, but the overall dimension is still kept low.
- Issues faced (if any)
- Attempts to resolve issues (if any)
- Issues resolved (if any)
- Next steps
 - Complete the 2 action plans mentioned above

- Since we decided to use Option A, I can also try to tune color space independently for each stain. As mentioned, brightness would benefit H&E stain, but for IHG stains, color seems to be more important.
- References (Mention if you built up on someone else's work)
 - Madusanka, N., Jayalath, P., Fernando, D., Yasakethu, L., & Lee, B.-I. (2023). Impact of H&E Stain Normalization on Deep Learning Models in Cancer Image Classification: Performance, Complexity, and Trade-Offs. *Cancers*, 15(16), 4144. <https://doi.org/10.3390/cancers15164144>
 - Bishnoi, Vidhi, and Nidhi, Goel. (2023). A Color-Based Deep-Learning Approach for Tissue Slide Lung Cancer Classification. *Biomedical Signal Processing and Control*.
www.sciencedirect.com/science/article/abs/pii/S1746809423005840