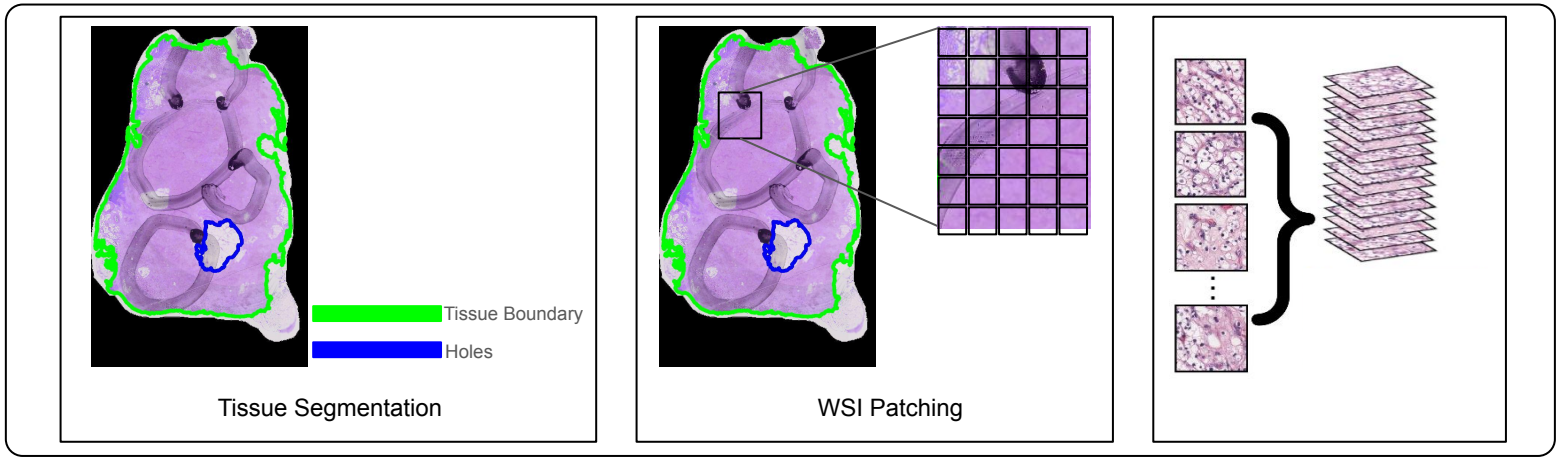
Member(s):

Subhrangshu Bit

Harsh Sharma

Approaches

Preprocessing

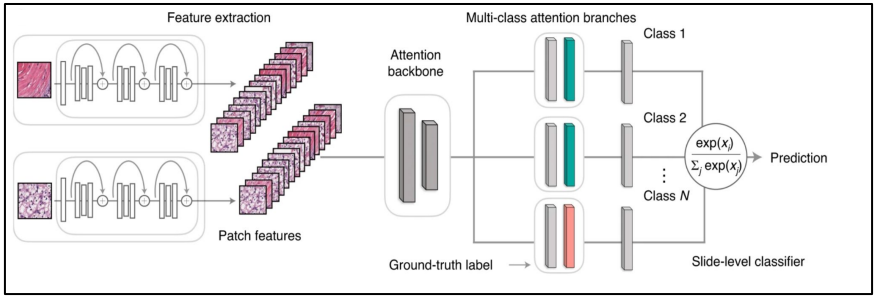


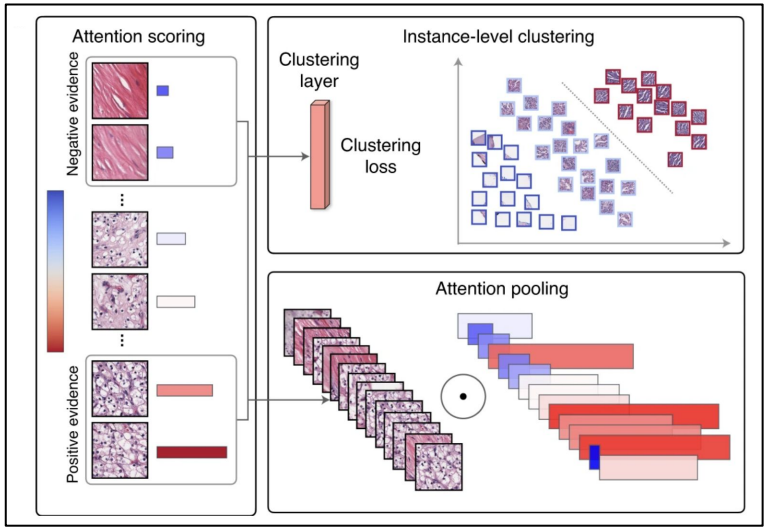
Models

- CLAM (**CL**ustering constrained **A**ttention **M**ultiple instance learning)
- CTransPath (**C**NN - **Trans**former - **Path**ology)
- Graph-Transformer

Approaches

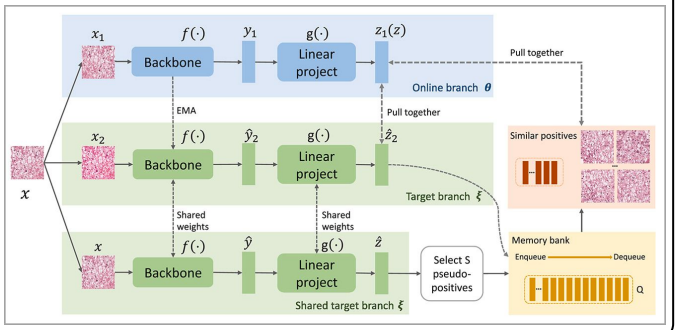
CLAM





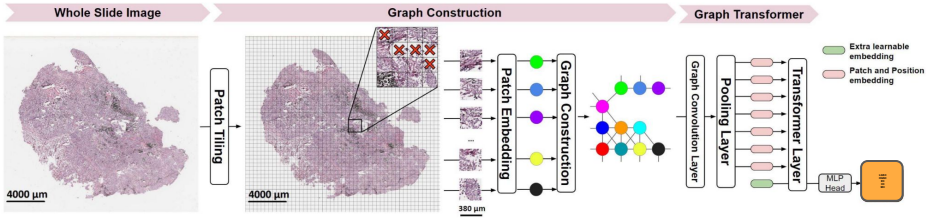
CTransPath

Pretrained module trained using contrastive learning on H & E stained whole slide images, using a Swin transformer



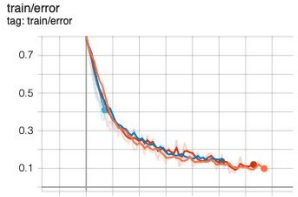
Graph-Transformer

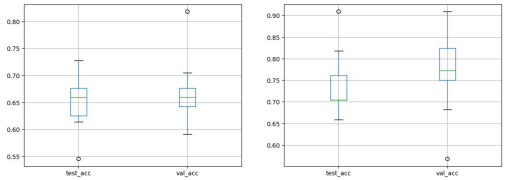
- Preprocessing - CLAM
- Feature Extraction - CTransPath

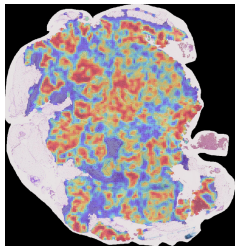


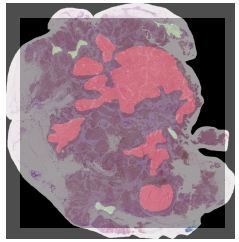
Experiment Results

CLAM

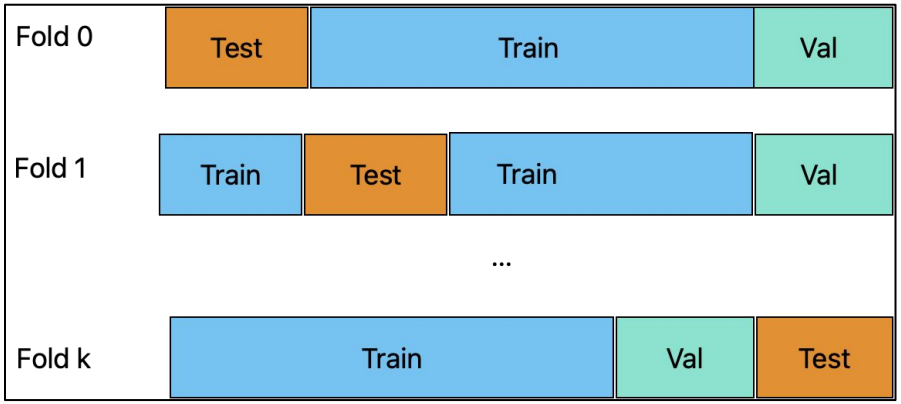








K-Fold generation



Method 🔥	Features ❄️	# Parameters	Balanced Accuracy (%) (k-fold) Average(std)
CLAM	ResNet50	664K	65.23 (5.2)
CLAM	CTransPath		74.09 (7.3)
Graph Transformer (best)	ResNet50	300K	68.5 (3.8)
Graph Transformer (best)	CTransPath		77.3 (5.7)

Discussions

- High standard deviation in k-folds, which we suspect is due to highly varying data sources (20 labs).
- In Graph Transformer, instead of using the whole image for building the graph we only use small section of the image selected at random.
- This increases the efficiency of the model (faster training), but instability in training of the Graph Transformer. Although he model performance is at par.

Next Steps

- Hyper-parameter tuning
- Test tuned model on the original Kaggle dataset
- Train model with image augmentations