**INTRODUCTION**

- Tissue images are complex in nature and demands expert hands in the field for analysis.
- Trained Machine Learning (ML) algorithms can effectively overcome this drawback by automated classification of given sample.
- Support Vector Machine (SVM) is one of such machine learning algorithm used for image classification.
- Pre-processing and feature extraction are closely related to the performance of ML model.
- Gray Level Co-occurrence Matrix (GLCM) is used to calculate the statistical features from the input.

**METHOD**

- Sample: Squamous cell carcinoma (SCC) tissue
- Microscope: Olympus BX15
- Objective lens: 40X
- Image size: 1360 x 1024 pixels

**RESULTS**

- **ML Training**
  - GLCM features
  - Dataset: Total number of images =200
  - Training dataset=160
  - Test dataset=40

- **ML Models**
  - DT- Decision tree
  - DA- Discriminant analysis
  - NB- Naïve Bayes
  - SVM- Support Vector Machine
  - KNN- K Nearest Neighbor

**Figure 1. Validation accuracy of ML models trained with GLCM features and PCA analyzed GLCM features for 5,7 and 10 fold cross validation**

- **SVM Testing**
  - True label:
    - Normal: 10
    - WD: 1 7 1 1
    - MD: 3
    - PD: 2

- **Predicted label**

**Figure 2. Performance matrix for SVM model testing which is trained with PCA analyzed GLCM features for 7 fold cross validation**

- **Dataset**
  - Total number of images =200
  - Training dataset=160
  - Test dataset=40

- **ML Models**
  - DT- Decision tree
  - DA- Discriminant analysis
  - NB- Naïve Bayes
  - SVM- Support Vector Machine
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**CONCLUSION**

- Feature ranking enhances the performance of ML model.
- SVM model trained with PCA ranked GLCM features showed higher classification accuracy.

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