



Project 8: Driver drowsiness detection

Group 1

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Problem statement

Fatigue driving is often related to car accidents, and nearly 20% of car accidents are caused by driver drowsiness. Driver drowsiness detection is installed on vehicles to detect the tiredness of the driver, it contains different detection criteria such as Steering pattern monitoring, Vehicle position in lane monitoring, Driver eye/face monitoring, or brain activity monitoring.

The detection device may send out alarms warning the drivers or use different methods to prevent car accidents from happening.

In this specific project, I'm using the driver drowsiness dataset to detect the facial condition of the drivers.

Dataset overview



Dataset overview



Data distribution

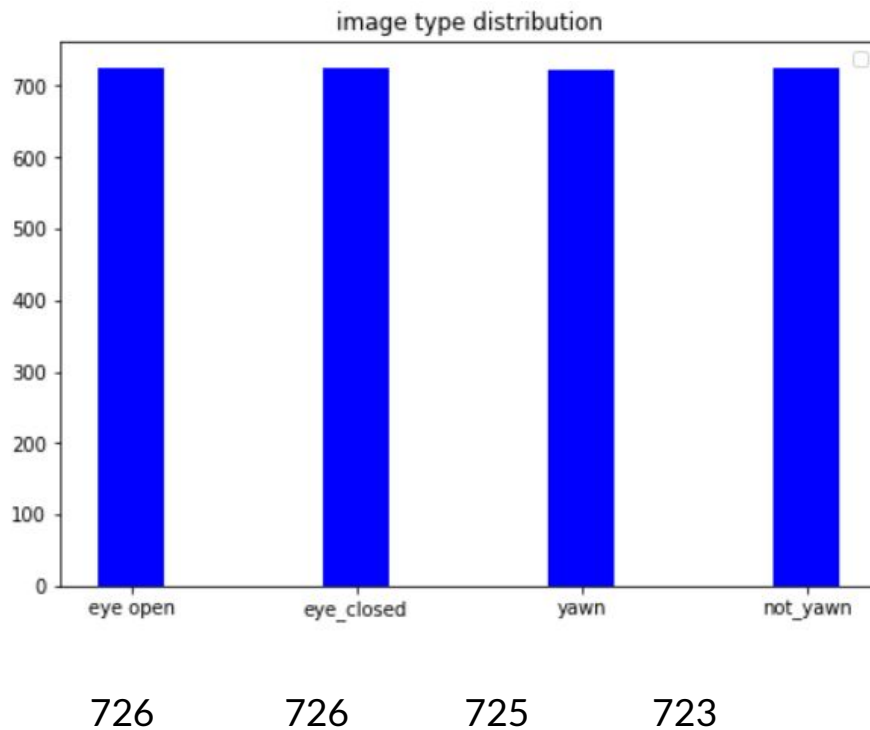


Image processing





Model selection

Machine Learning Approaches:

K-Nearest Neighbors

Support Vector Machine

Gaussian Naive Bayes

Deep Learning Approaches:

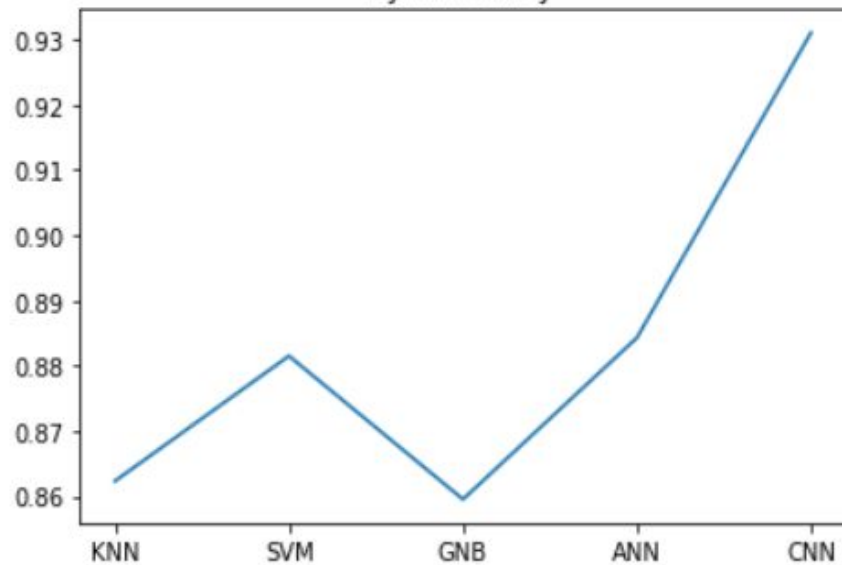
CNN

ANN

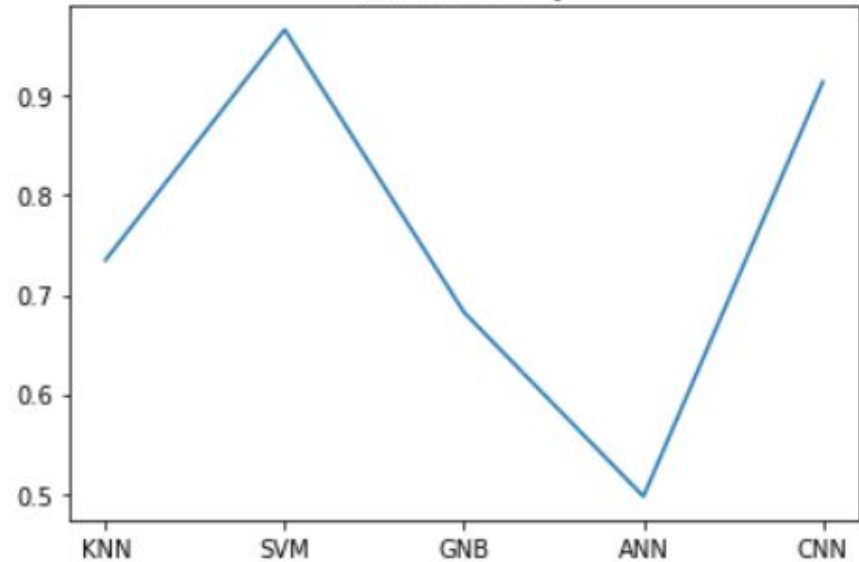


Model evaluation

EyE Accuracy

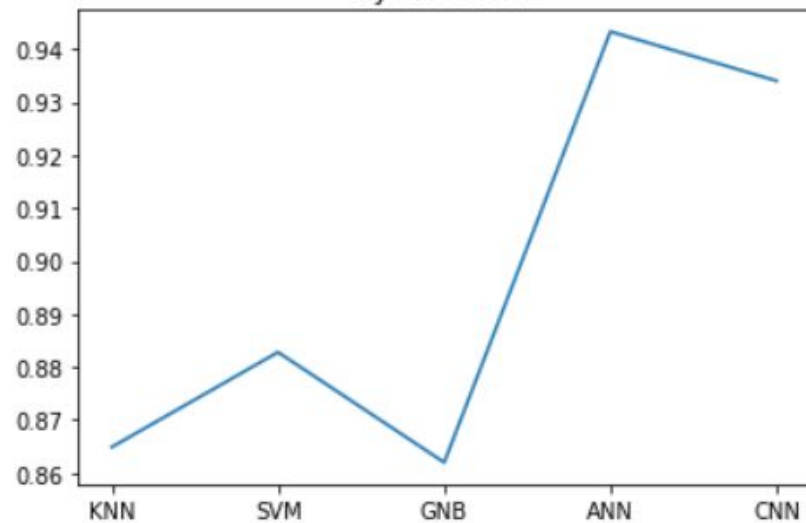


Yawn Accuracy

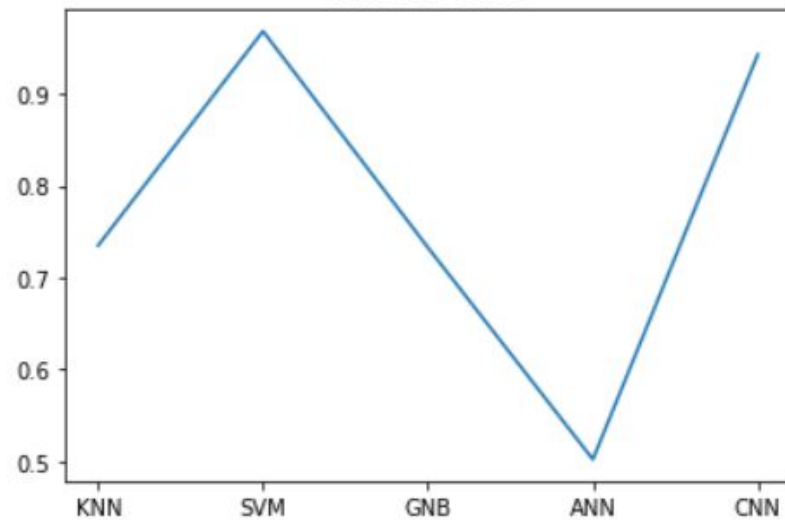




Eye Precision

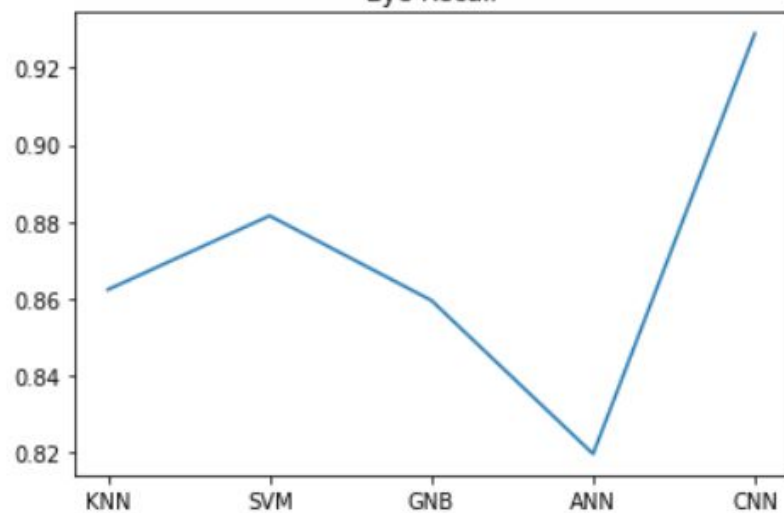


Yawn Precision

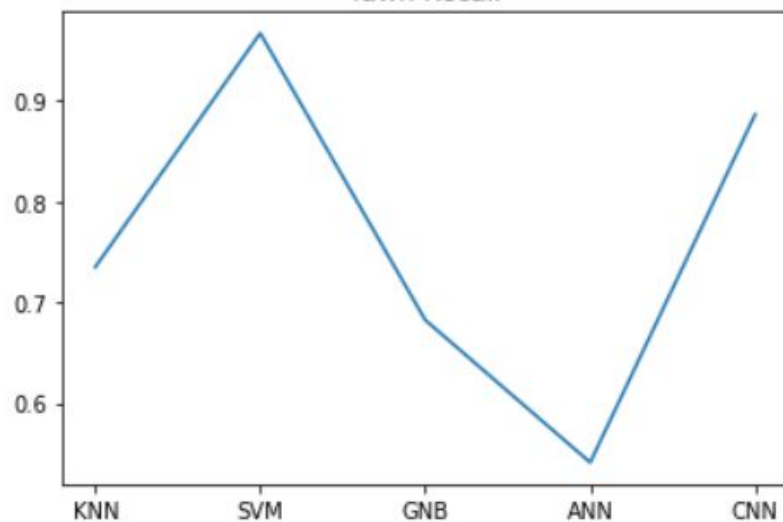




Eye Recall

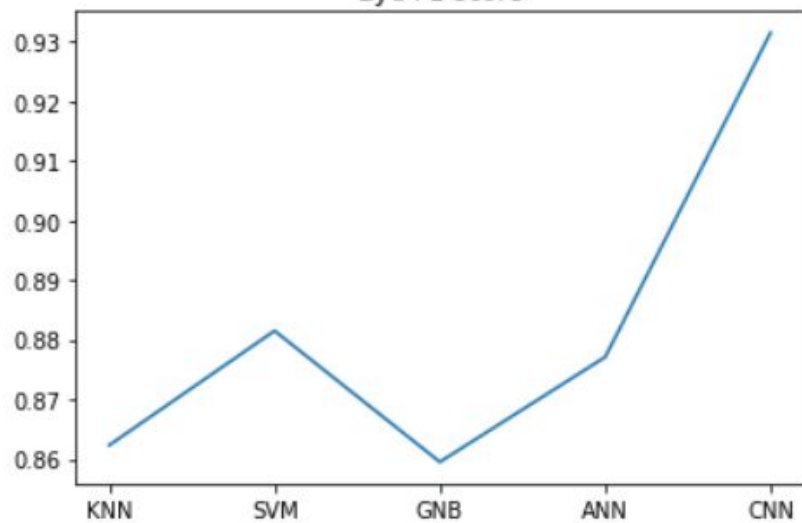


Yawn Recall

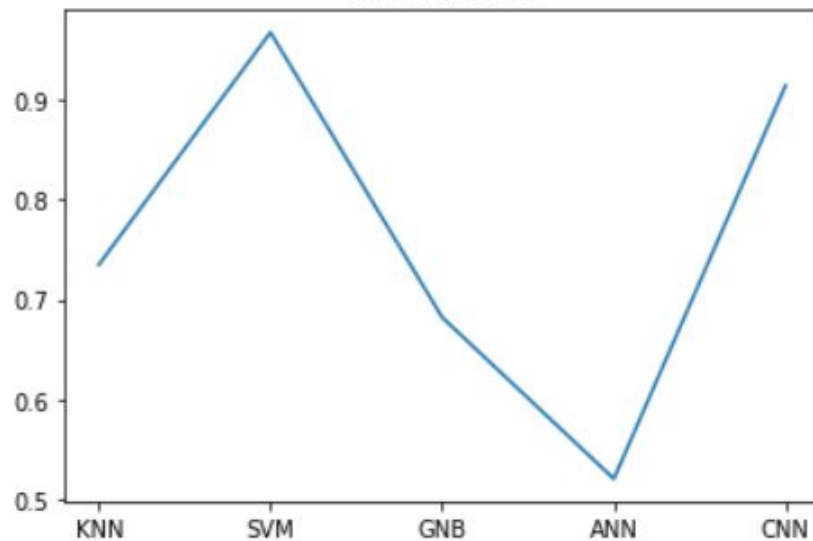




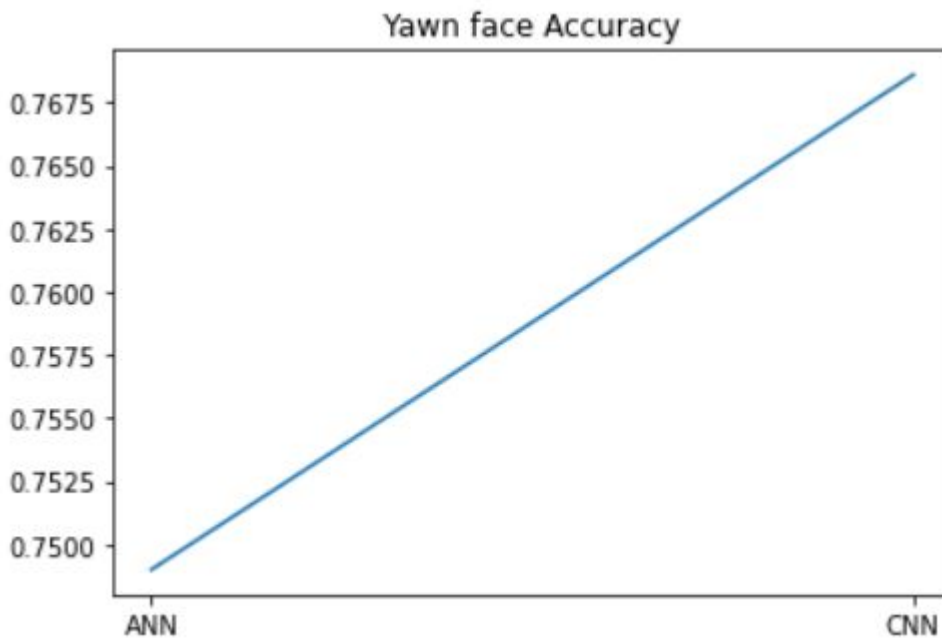
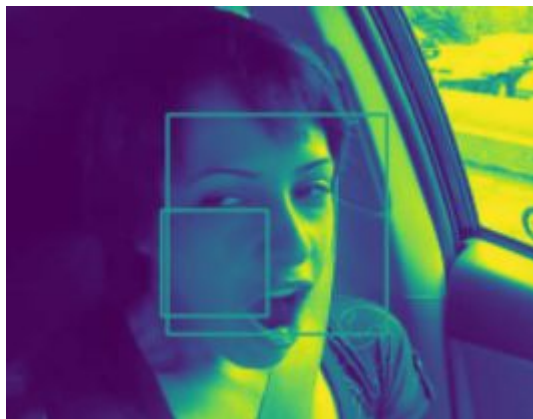
Eye F1 score



Yawn F1 score

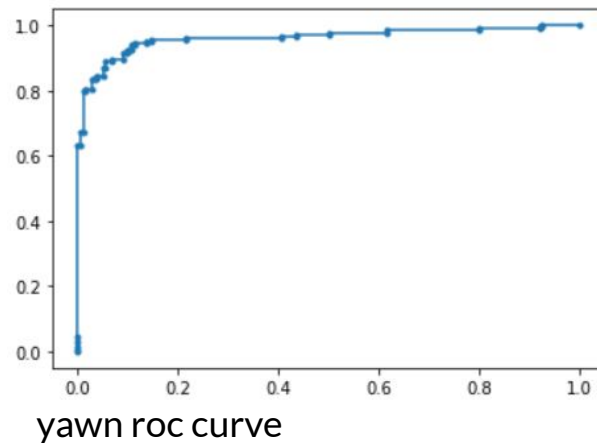
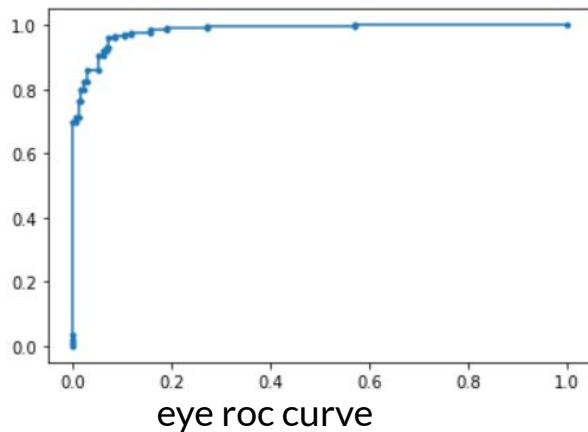


Face extraction



Conclusion

We will choose CNN as our final choice of model





Questions