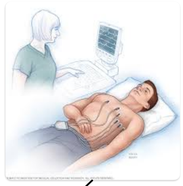
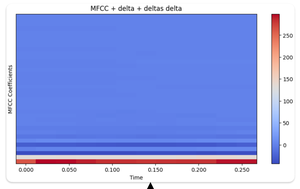
ECG model

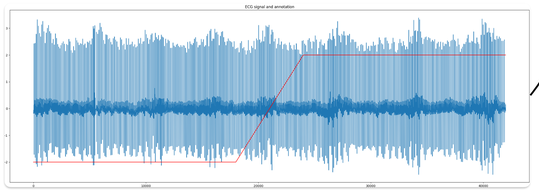


ECG (numerical form)



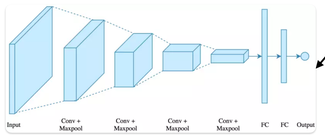
MFCC feature extraction
(treated as sound signal)

ECG signal

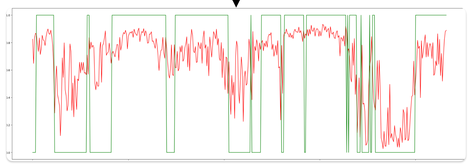


Convolutional Neural Network
(treated as image)

How CNN works



Binary Classification



Visualize the whole sleeping period

You have X% of witnessing OSA
For example (89%)

SpO2 model

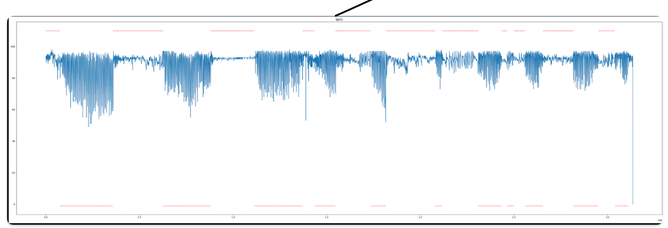
SpO2 (numerical form)

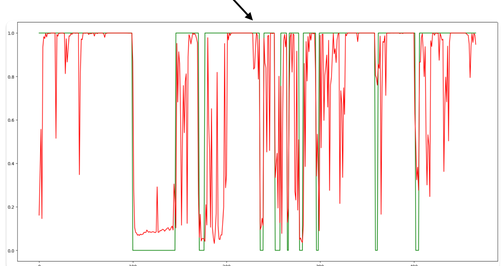
Convolutional Neural Network
(Extract 1 dimension pattern)
(same structure as above)

Binary Classification

You have X% of witnessing OSA
For example (89%)

SpO2 signal





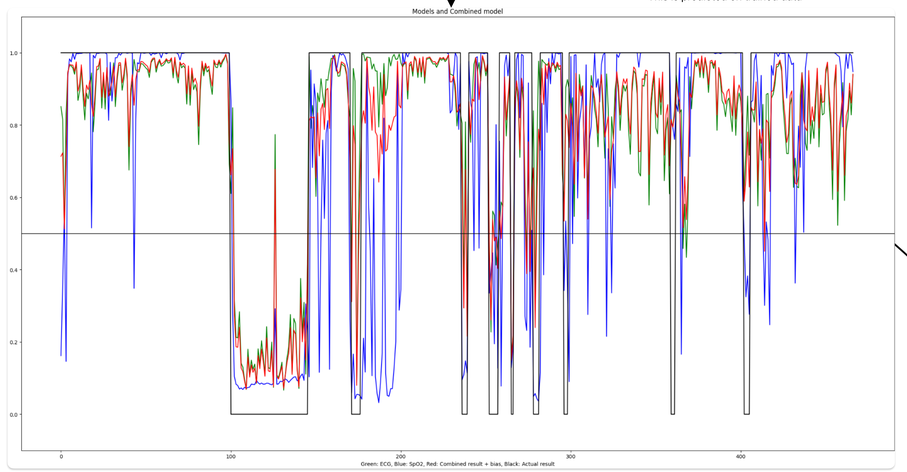
Visualize the whole sleeping period

Combined model

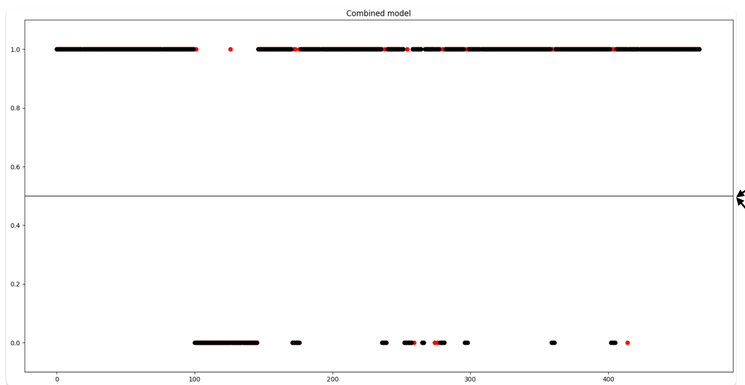
Combined both predictions of two models with extra bias for ECG
(since ECG have trained on more patients)

Weight sum:
ECG: 0.8
SpO2; 0.2

This is predicted on trained data



Green: ECG, Blue: SpO2, Red: Combined result + bias, Black: Actual result



Where red dots appear is a presentation of wrong prediction with combined model

Accuracy (correct / total) of:
Bias = 0.25 -> 0.866
Bias = 0 -> 0.9

=> Although without bias it seems to be more accurate but the SpO2 have trained on few patients which may have bias for them and not enough generalization