

## MP #2: Peer Feedback #2 (Pre-Feedback Work to Date)

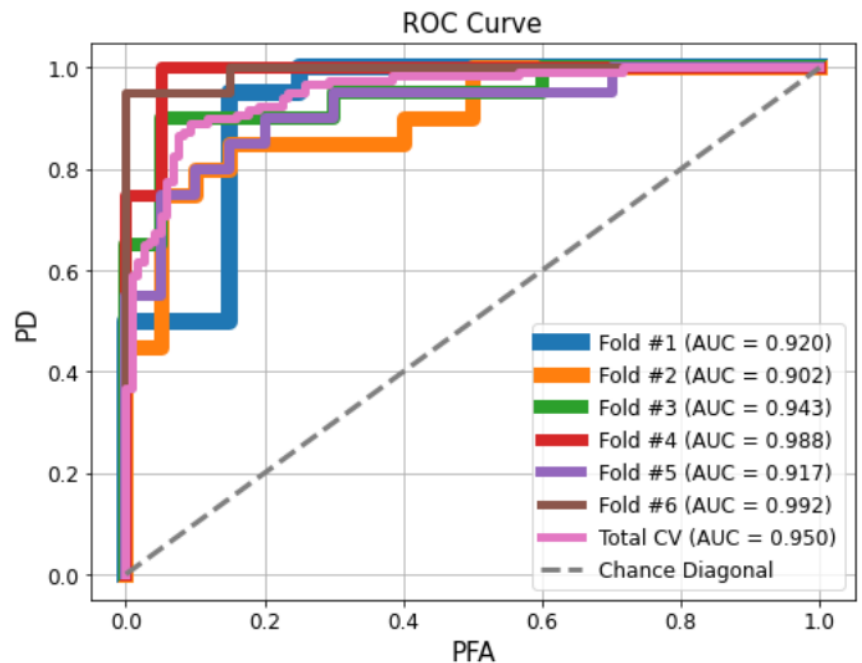
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The structure of my work to date format will follow the recommended project milestones.

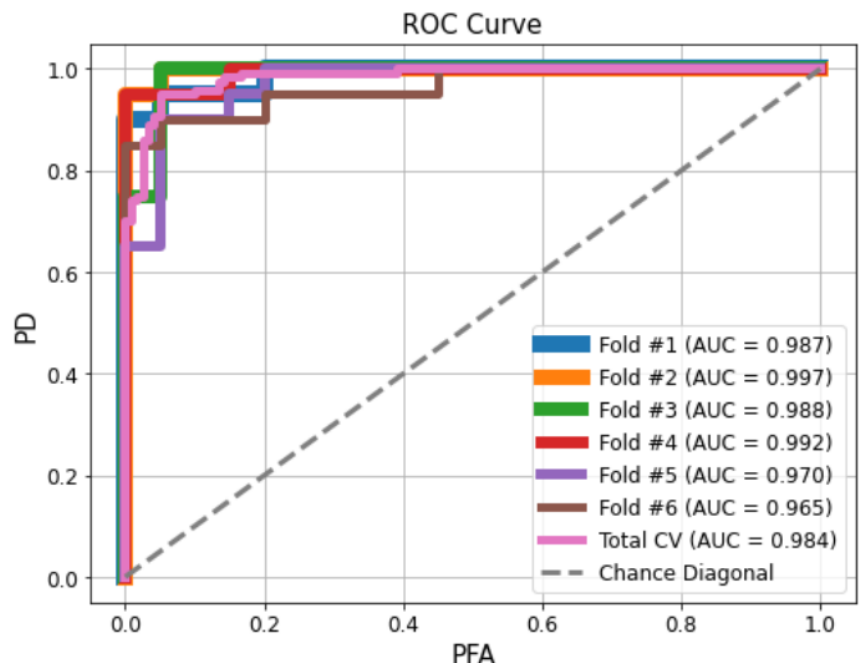
Note: Only the code written for testing my algorithm will be displayed to help peer review/feedback.

In Peer Feedback #1, I only completed Week 1 milestones. Therefore, in this session, to fully demonstrate that I have completed milestones for Week 2, 3, and 4, I decide to export the ROC plots for imaginary dataset and overt dataset first, as shown below (left blank space saved for Post-Feedback Annotation).

```
[23]: # Imaginary Dataset
# Provide the ROC for each 1st-level cross-validation fold (6 ROCs),
# and the total cross-validated ROC on a single graph.
plot_ROC(ds_img)
```

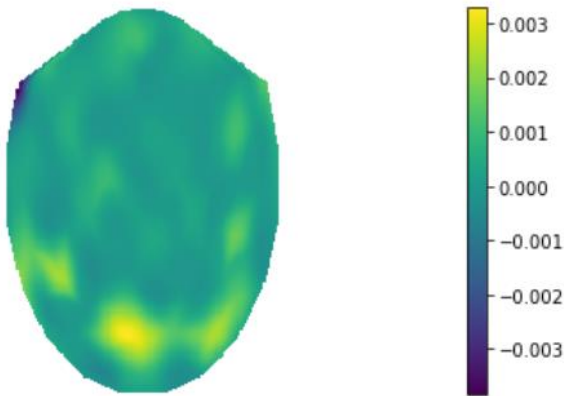


```
[24]: # Overt Dataset
# Provide the ROC for each 1st-level cross-validation fold (6 ROCs),
# and the total cross-validated ROC on a single graph.
plot_ROC(ds_overt)
```

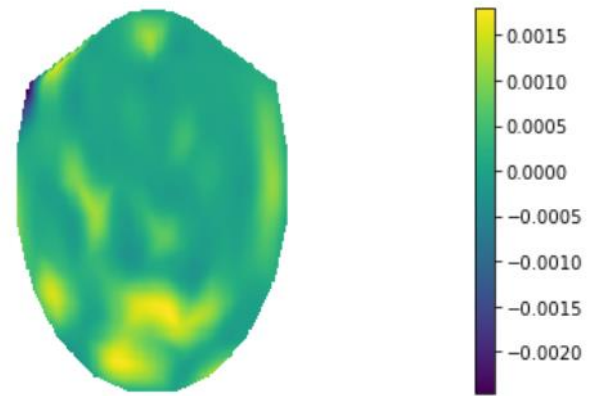


Then, let us visualize the  $204 \times 1$  vector weights on the brain surface (Imaginary and Overt).

```
# Visualize the 204 * 1 weights for Imaginary Dataset
show_chanWeights(weights_img)
```



```
# Visualize the 204 * 1 weights for Overt Dataset
show_chanWeights(weights_overt)
```



To demonstrate that I can successfully implement the  $2^{nd}$  level cross-validation to optimize the regularization parameter  $\lambda$  for each  $1^{st}$  level fold, intermediate results during Two-Level Cross Validation are shown below.

```
[13]: # Imaginary Dataset
# Extract the decision statistics as "ds_img"
# Extract the accuracy for each 1st level fold as "acc_img"
# The last accuracy value is the average accuracy
# (total cross-validated)
# Extract the 204 * 1 weights vector as "weights_img"
ds_img, acc_img, weights_img = BCI_Decode(img1, img2)
print(acc_img)
```

```
Current first level fold index is 1
Current optimal regularization parameter is 1.00
Current first level fold index is 2
Current optimal regularization parameter is 0.10
Current first level fold index is 3
Current optimal regularization parameter is 0.01
Current first level fold index is 4
Current optimal regularization parameter is 1.00
Current first level fold index is 5
Current optimal regularization parameter is 0.01
Current first level fold index is 6
Current optimal regularization parameter is 0.10
[0.825 0.85 0.9 0.95 0.825 0.975 0.8875]
```