

# Artificial Intelligence

# Artificial Intelligence

## Main topics

- Machine learning and the «data life cycle»
- Validation and classification metrics
- Feature extraction
- Feature selection
- ML classifiers

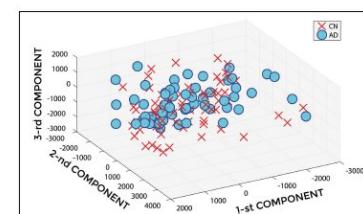


FIGURE 2 | PCA coefficients for the comparison between AD (○ symbol) and CN (× symbol) when using GM tissue probability map and isotropic Gaussian kernel with  $10\text{ mm}^3$  FWHM for smoothing. 1st, 2nd, and 3rd components are shown.

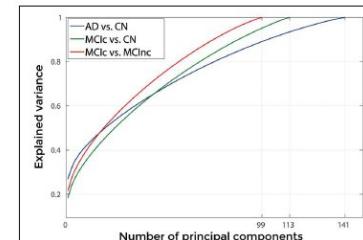


FIGURE 3 | Explained Variance as a function of the number of considered Principal Components, when using GM tissue probability map and no smoothing, for the following comparisons: AD vs. CN, MCic vs. CN, MCic vs. MCinc.

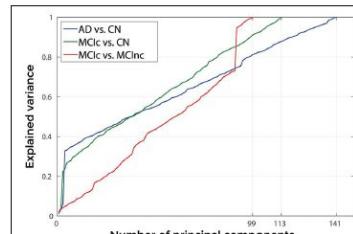


FIGURE 4 | Explained Variance as a function of the number of considered principal components sorted in accordance to their FDR, when using GM tissue probability map and no smoothing, for the following comparisons: AD vs. CN, MCic vs. CN, MCic vs. MCinc.

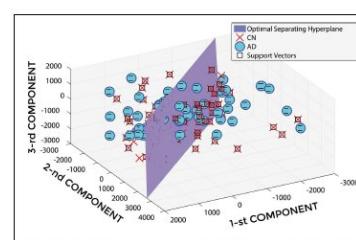


FIGURE 5 | Hyper-plane planes separating AD (○ symbol) from CN (× symbol) PCA coefficients (3 PCA coefficients), and defined Support Vectors (□ symbol), when using GM tissue probability map and an isotropic Gaussian kernel with  $10\text{ mm}^3$  FWHM for smoothing. 1st, 2nd, and 3rd components are shown.

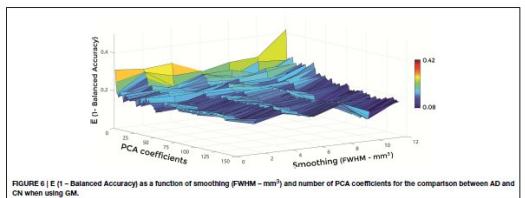


FIGURE 6 | E (1 - Balanced Accuracy) as a function of smoothing (FWHM - mm<sup>3</sup>) and number of PCA coefficients for the comparison between AD and CN when using GM.

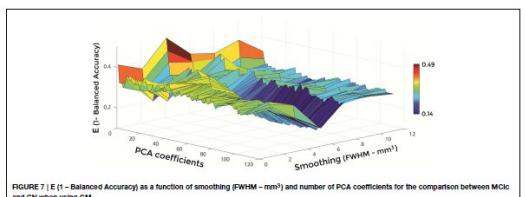


FIGURE 7 | E (1 - Balanced Accuracy) as a function of smoothing (FWHM - mm<sup>3</sup>) and number of PCA coefficients for the comparison between MCic and CN when using GM.

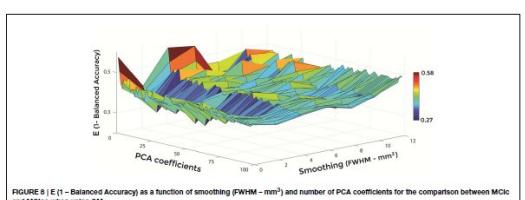
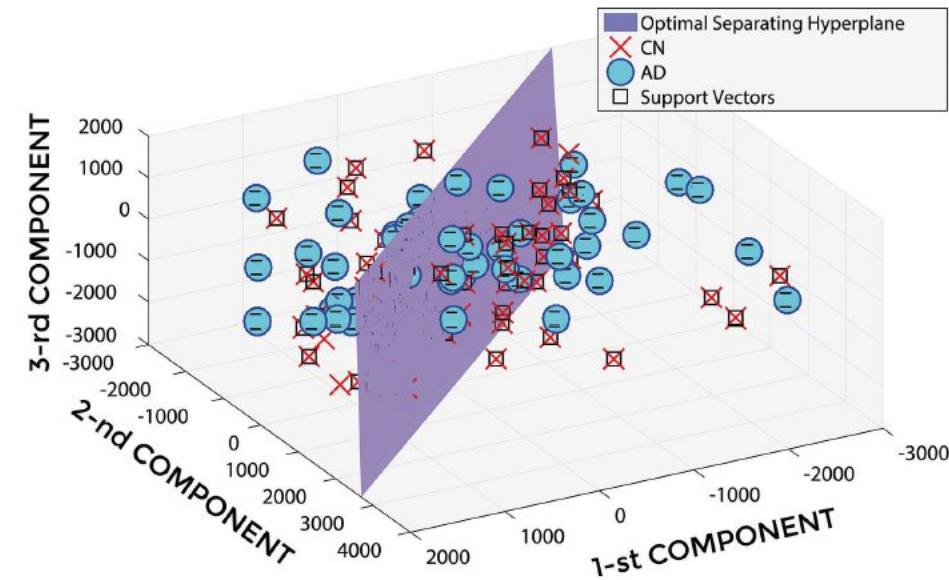


FIGURE 8 | E (1 - Balanced Accuracy) as a function of smoothing (FWHM - mm<sup>3</sup>) and number of PCA coefficients for the comparison between MCic and MCinc when using GM.

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All Features



Feature Selection



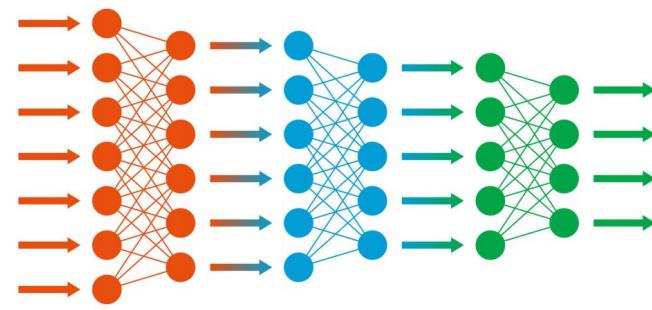
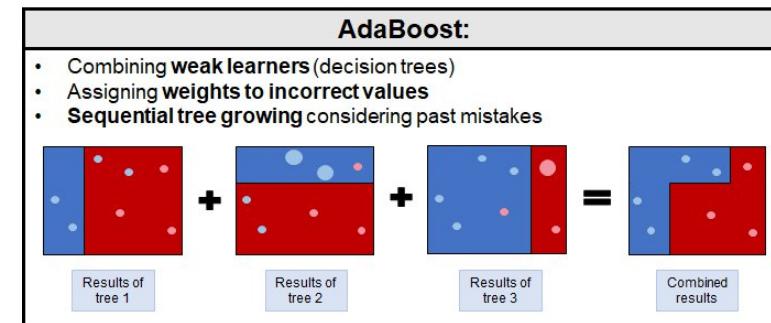
Final Features



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## Requirements

- No specific requirement
- Updates @ <https://christiansalvatore.github.io/ai-stat/>