BrainIAK Tutorials: User-friendly tutorials for cutting-edge MVPA methods

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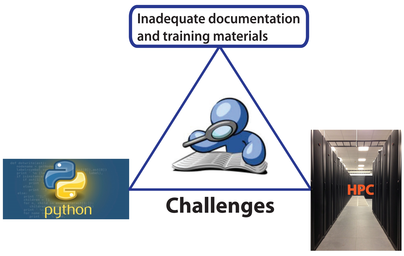
Goal

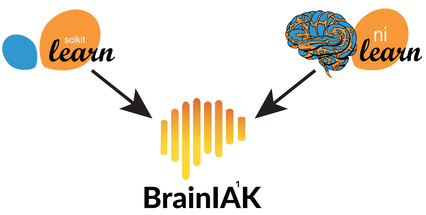
Create user-friendly learning materials for advanced fMRI analysis.



Methods

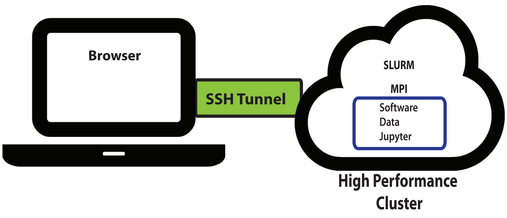
Tools: jupyter bash scripts, SLURM

Packages:

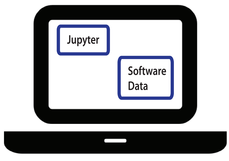


Publicly available datasets: Block Designs, Event Related Designs, Movie Datasets.

A. Tutorial architecture at Yale



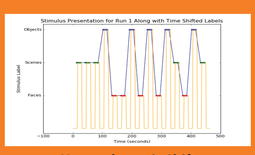
B. Tutorial on individual machine



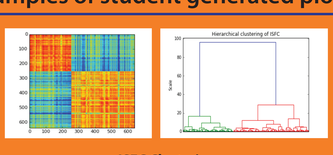
C. Tutorial topics - from the basics to the advanced.

Basics	Classification/ Correlation	Advanced Techniques
Data Loading	Cross-validation	Searchlights
Z-scoring	Dimensionality Reduction	Connectivity: Full Correlation Matrix Analysis[5,6]
Plotting Time-Series	RSA	Functional Alignment: Inter-Subject Correlation[3], Inter-Subject Functional Correlation[4], Shared Response Model[2]
Haemodynamic Shift	Pipelines	Real-time fMRI[7]

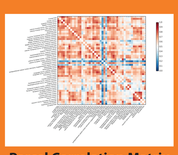
D. Samples of student generated plots



Haemodynamic Shift

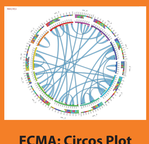


ISFC Clustering



Parcel Correlation Matrix

Classification Accuracy



FCMA: Circos Plot

Highlights

These tutorials were successfully used as part of an advanced fMRI analysis course at Yale University.

Novice users were performing advanced analysis by the end of the course.

These matrerials can be easily integrated with other teaching materials.

Future Work

These materials are undergoing alpha-testing currently.

Public release is planned in late Fall 2018. To view sample tutorials and get updates, please fill out this form using the QR code.

Princeton Fall 2018 course.

Acknowledgements

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Plot Credit: Clara Colombatto, Jacob Prince, Qihong Liu, and Sreejan Kumar.

References

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BrainIAK: http://brainiak.org

Other Posters: BrainIAK **2023,** Matrix-Norm **2535,** Real-Time **2045; 2858**