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Comparison of strategies to elicit motor imagery-related brain patterns in multimodal BCI settings

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Introduction

- Seven healthy subjects (27.2 +/- 2.1 years old, 1 Male)
- 2 sessions
- 1-2 weeks between sessions
- 64 BrainAmp Active electrodes
  - TP9/TP10 REF/GND

Methods

- 1 run: 8 min
- Feature selection: 5 min
- MI/Rest Task: 4s
- Red dot: Motor Imagery Task
- Blue dot Resting state
- White cross: selection of the target with gaze

Classification Results

- No Statistical differences between sessions
- No Effect of learning
- Statistical differences for SVM
  - Trend on LDA
  - 2 ways permuted ANOVA, p < 0.01

Conclusion

- Differences between strategies: a way to improve the performances
- Being in control of the robot changes the statistical differences in frequency more than in intensity

High variability within the resting state between trials
Motor imagery task more redundant between trials
The Resting state instruction remains to tackle for more consistency

Synchronization related to robotic arm movement,
A possible pattern of preparation/pre-trigger