



MP34-19

**Brain Network Regional Flexibility Has
Relationship With Mental Workload During
Robot-assisted Surgery Performance**

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Introduction and Methods

Mental Workload (MWL):

- Proportion of mental capacity used at a certain moment.
- Brain's ability to process information- Limited
- Overload - Poor performance.

Challenge:

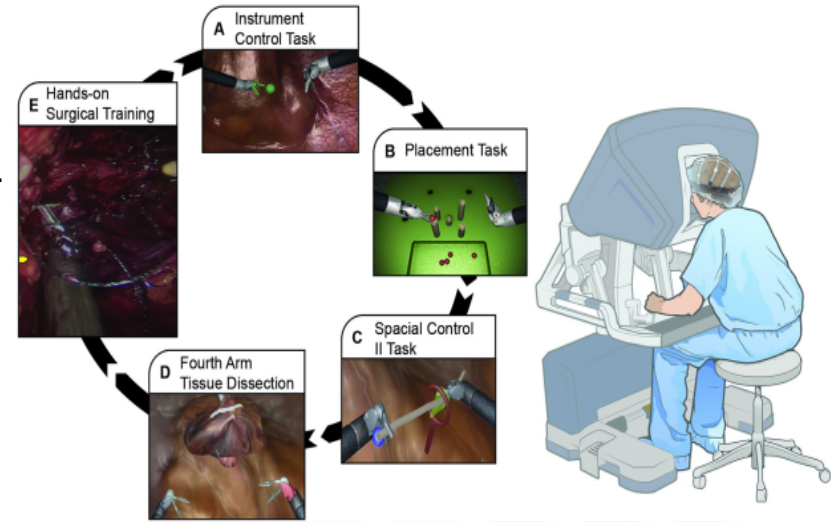
- No objective methodology for monitoring of surgeon's MWL.

Goal:

- Electroencephalogram (EEG) - MWL while performing surgical tasks on robotic simulator.

Methods:

- EEG data
- 22 medical students (6 sessions x1 year)
- Fundamental skills of robotic surgery (FSRS)

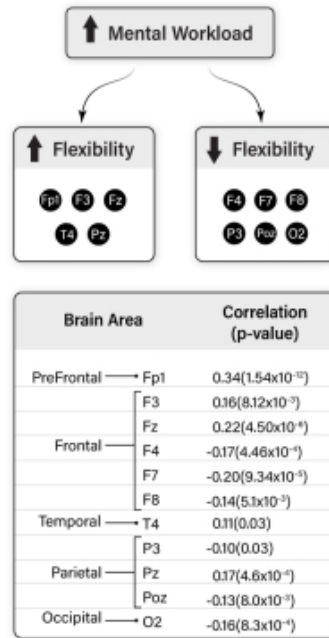


Analyses

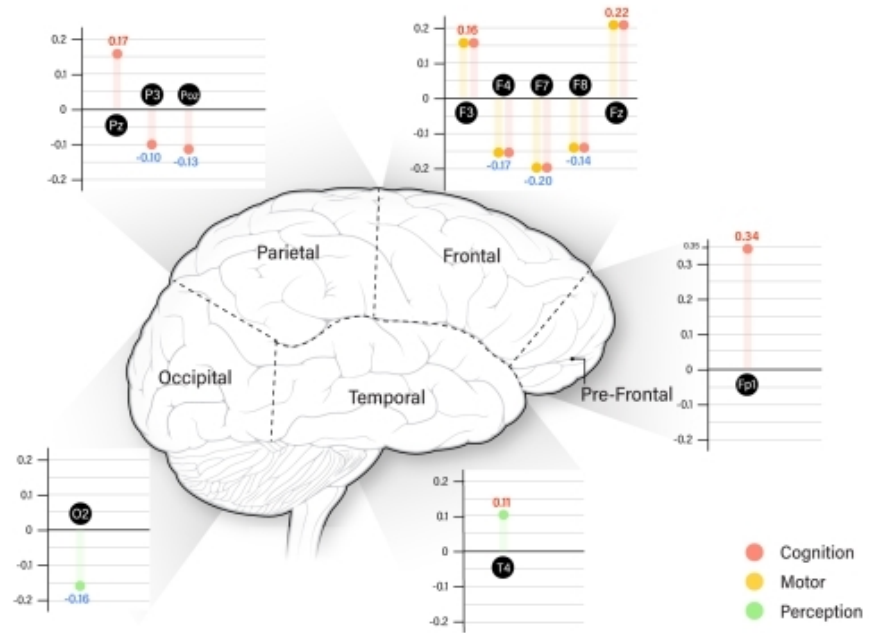
■ Network flexibility- Portion of time that brain area changes its functional community status as a respond toward processing a task.

■ Neuroscience and Community Detection - Network Flexibility of brain areas

■ Pearson Correlation- Correlation between MWL of subjects and brain network regional flexibility at brain areas.



Results



Conclusion

- Brain regional network flexibility can be used for evaluation of motor, cognitive, and perceptual MWL

This method identifies type of MWL and can be used to identify the reasons of overload based on activated brain areas.