

From mind to music: developing a brain computer music interface for children with severe quadriplegia

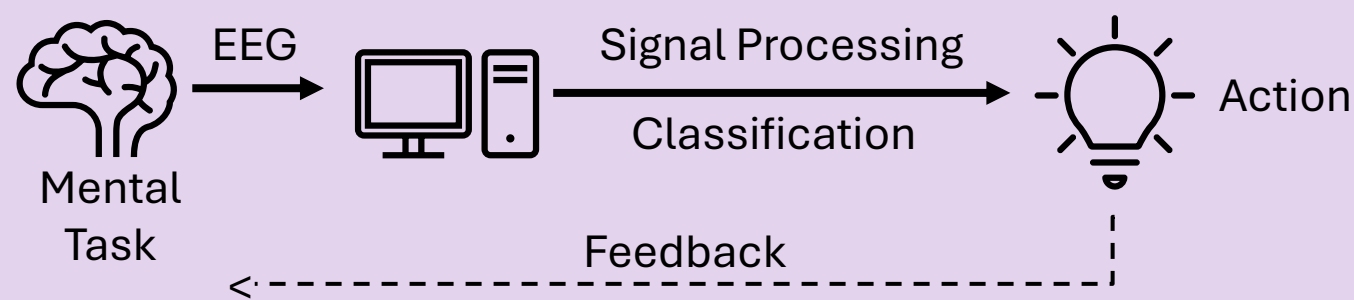
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Introduction

- Children have been left behind with BCI development¹
- BCI for music are too complicated and difficult for children^{2,3}
- Children with QCP often have visual impairment limiting visual BCI effectiveness⁴

What is a BCI?



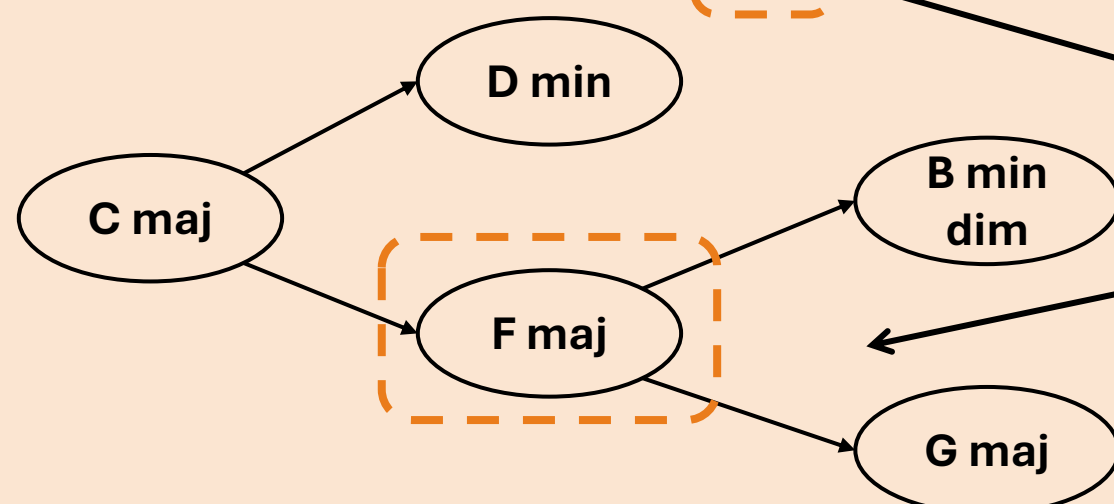
Software Design

Auditory Oddball Paradigm:



Repeats until sufficient P300 is induced

Chord Selection Decision Tree:



Selects chord once model has 80% probability signal is P300

Chords Functional Harmony:

Tonic (I) Subdominant (IV) Dominant (V)

Next Chord Choice:



Hardware

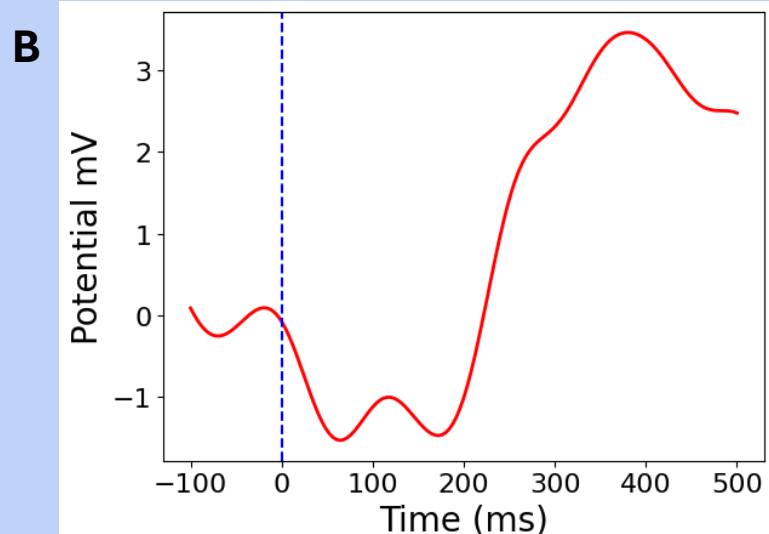
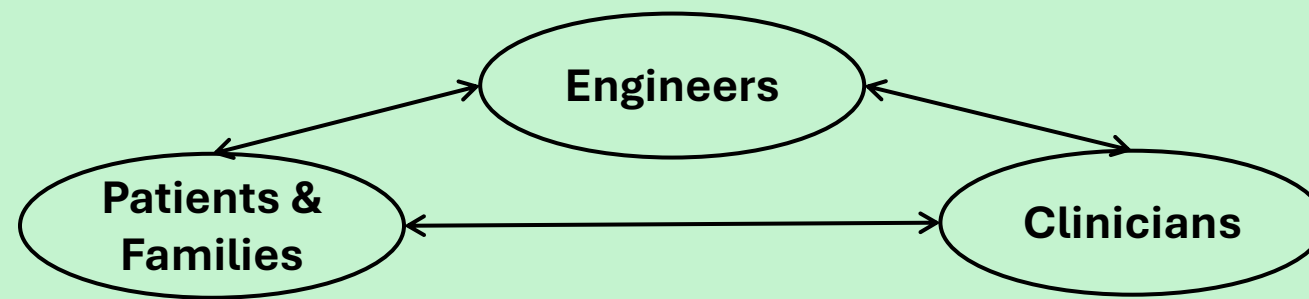


Figure 1. A an IDUN Guardian in-ear EEG⁵. B averaged auditory P300 response using the IDUN Guardian. Vertical line indicates stimulus onset

Patient Centered Design



Expected Outcomes

- Introduction into music through BCI
- Provide children new avenue for learning and play
- Developing and auditory P300 BCI paradigm
- Establish children engagement in research group

References

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4. Rauchenzauner M. et al., 2021 *Neuropediatrics*
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Contact me

