Introduction

Imagine an immersive world where one could learn the skill to voluntarily self-regulate one’s brain activity. Using apps such as Headspace [1] for practicing meditation techniques are slowly gaining prominence. Virtual Reality headsets can create enriched and interactive worlds. Mobile EEG-wearables provide correlates of mental states [2,3].

What if one could combine these to learn the ability to concentrate in a busy environment or fully relax between meetings.

We explore how MindTrain - an immersive, gamified environment combining VR and EEG-based neurofeedback- enables users to self-regulate their mental states of concentration and relaxation.

Results

<table>
<thead>
<tr>
<th>Participant</th>
<th>ACC</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.78</td>
<td>0.87</td>
<td>0.72</td>
</tr>
<tr>
<td>2</td>
<td>0.79</td>
<td>0.78</td>
<td>0.8</td>
</tr>
<tr>
<td>3</td>
<td>0.72</td>
<td>0.69</td>
<td>0.68</td>
</tr>
<tr>
<td>4</td>
<td>0.69</td>
<td>0.69</td>
<td>0.68</td>
</tr>
<tr>
<td>Mean</td>
<td>0.75</td>
<td>0.77</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Conclusion & Future Work

Results of the pilot study indicate ...

1. effectiveness of the gamified neurofeedback environment.
2. a trade-off between being good at the concentration state or being able to come down to a relaxed state.

In our future research, we plan to modify the game mechanics by ...

1. coupling the strength of ammunition to the classifier output.
2. scaling difficulty with performance over time.
3. exploring calibration tasks for the collection of training data.

References: