



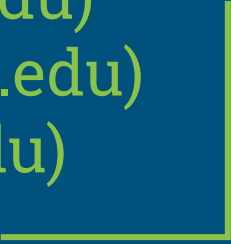
# MindGames

MIDTERM PROJECT REPORT

4/5/2022

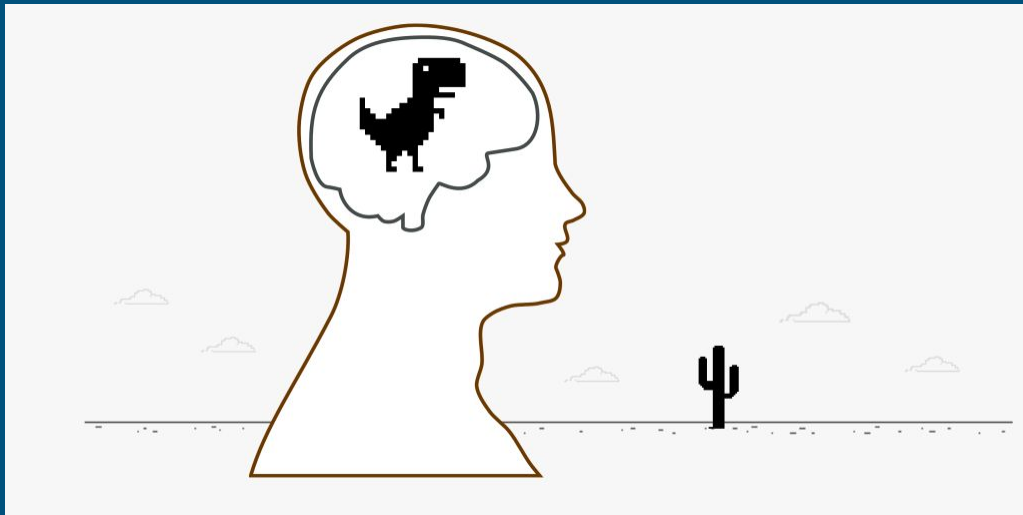


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# Our Idea

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- Enhance Accessibility
- Efficient Usage and Setup

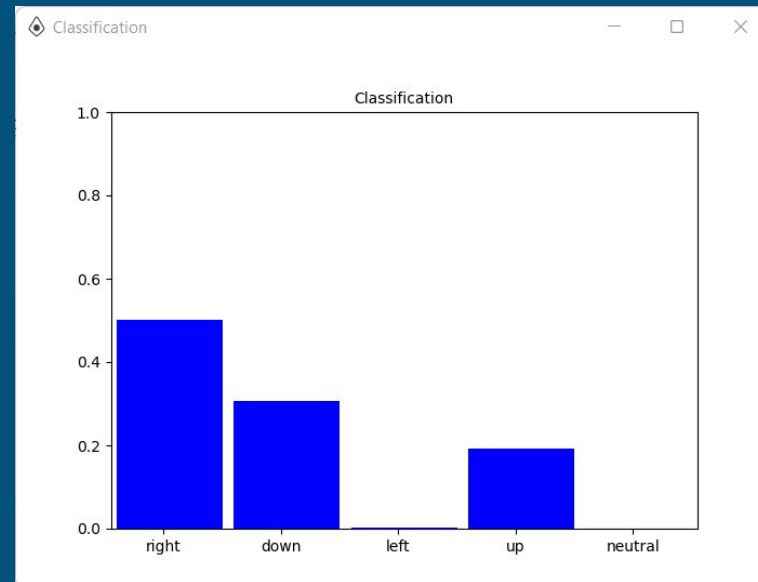
# Why Bother?

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- Motor-Limiting Diseases/Injuries
- Communication Improvement
- Muscle Activation is Nearly Universal

# Unraveling the Brain

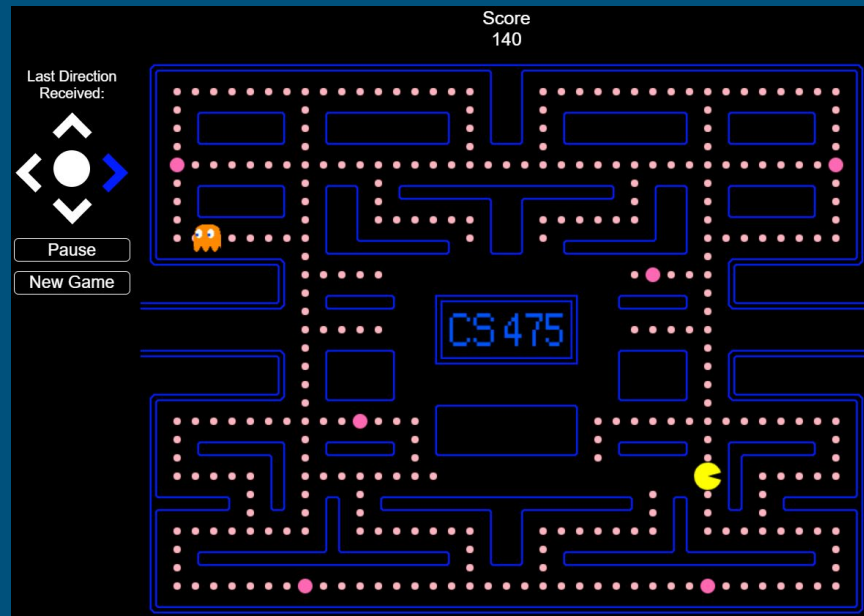
- Electroencephalography (EEG)
- Data and Signal Processing



# Mental Control - Not Just Sci-Fi

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- Not a Universal System Immediately
- Training Modules
- Continuous Comparison



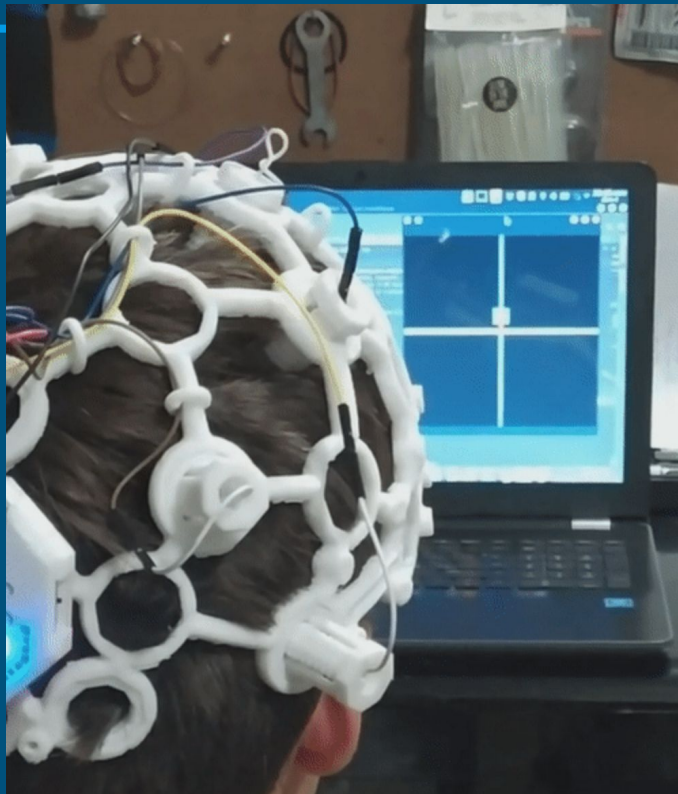
# Our Plan

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- Configure Headset
- Develop Efficient Method for Training
- Transmit Matched Commands to Pac-Man

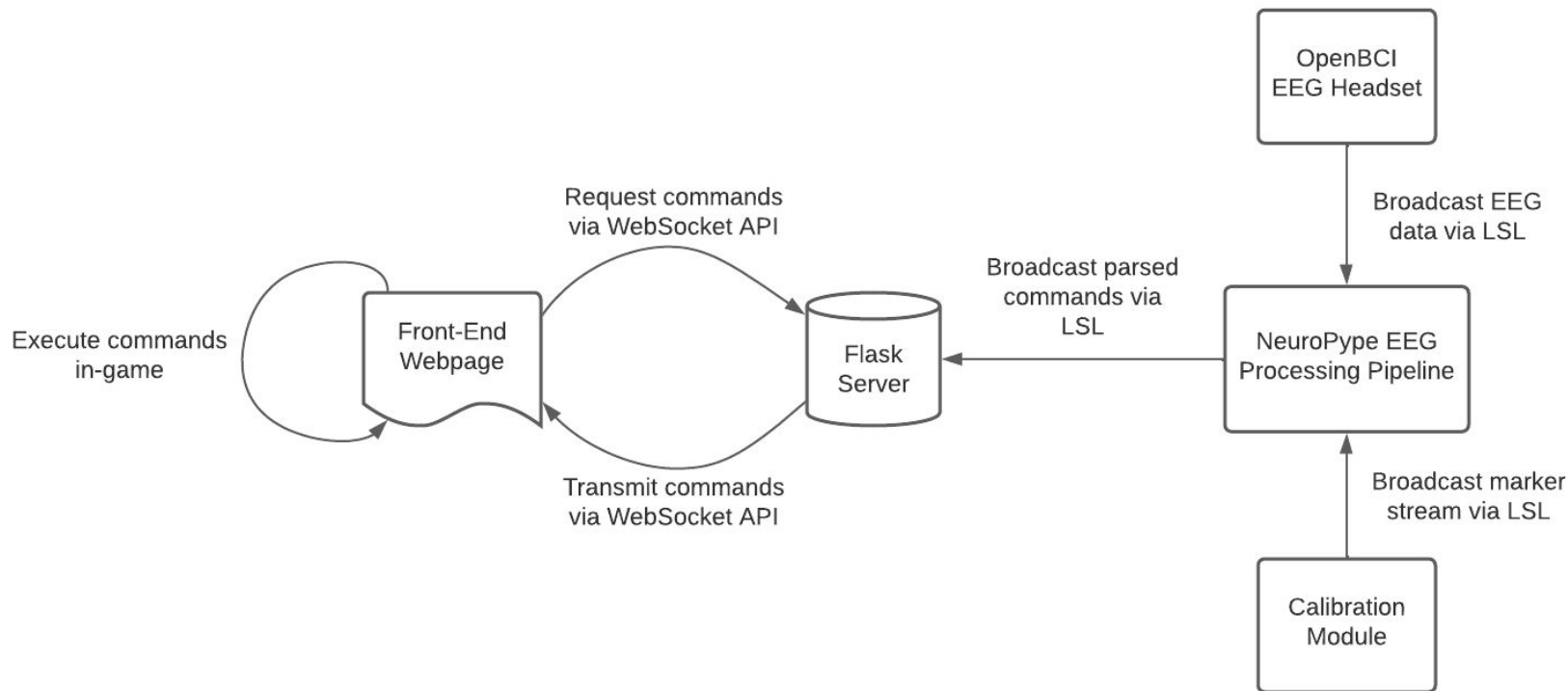
# Previous Solutions

Citation: <https://github.com/CrisSherban/BrainPad#readme>



- Bigger, More Complex Systems
- Generalized Signal Processing

# System Overview





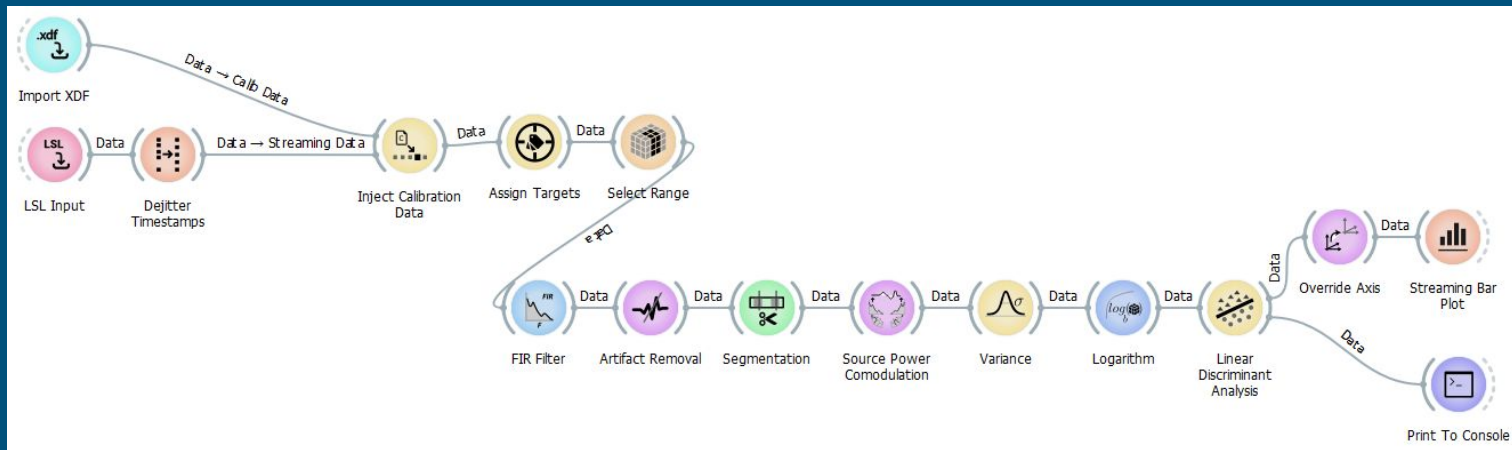
# Communication Protocols

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- Bluetooth
  - EEG data (external)
- LSL (Lab Streaming Layer)
  - EEG data (internal)
  - Marker stream
- WebSocket
  - Parsed commands

# Accomplished Work

- Configuration/Training
- Pipeline Connections
- Pac-Man



# Development Dynamics

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- Each Member Excelled in Certain Areas
- Consistent Group Meetings
- Individual Methodologies

# Lessons Learned

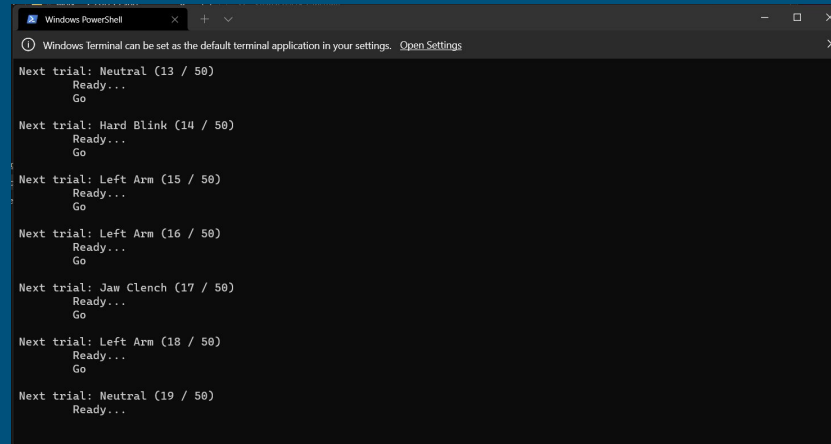
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- Importance of Subdivision of Tasks
- One Step at a Time
- Development Needs a Large Breadth

# What's Left?

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- Refinement of Signal Processing
- Expansion of Applicable Movements
- New and Different Real-World Applications



```
Windows PowerShell
Windows Terminal can be set as the default terminal application in your settings. Open Settings

Next trial: Neutral (13 / 50)
Ready...
Go

Next trial: Hard Blink (14 / 50)
Ready...
Go

Next trial: Left Arm (15 / 50)
Ready...
Go

Next trial: Left Arm (16 / 50)
Ready...
Go

Next trial: Jaw Clench (17 / 50)
Ready...
Go

Next trial: Left Arm (18 / 50)
Ready...
Go

Next trial: Neutral (19 / 50)
Ready...
```



Questions?