



# Music Therapy

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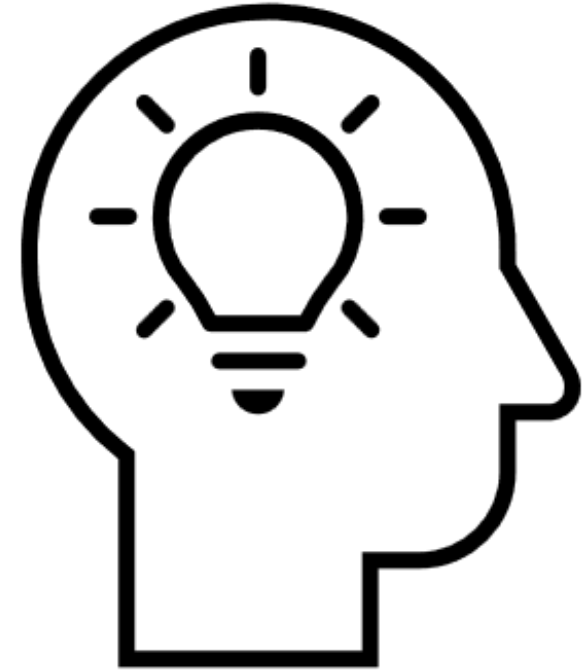


# The Issue

- Despite unprecedented medical progress made in recent years, there still exist many debilitating disorders which have devastating effects on motor function.
  - This includes Parkinson's Disease, Huntington's Disease and Multiple Sclerosis
- Despite the lack of a cure, treatment plans can be implemented to manage progression of damage and preserve quality of life
- Yet, many of the current treatments are highly intensive and invasive
  - Many even require surgery
- We are concerned about the lack of smaller scale solutions that can be easily and affordably integrated into everyday life

# Our Solution

A wearable device that can track a patient's gait to assess the progression of their disease and serve as a therapy tool to improve motor function.

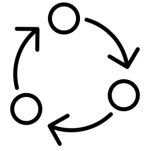


- Gait analysis is a diagnostic method used to assess the progression of debilitating disease and can be used to track the degradation or progression of a patient's motor function
- Music-based interventions have shown to yield great benefit in the treatment of motor impairment that translates to cognitive, speech, and language rehabilitation through entertainment
  - It utilizes the temporal locking process in which one system's motion or frequency entrains the frequency of another
- In our case, we plan to stimulate a patient's motor system such that it locks with the rhythm of the music
- Gait analysis with our wearable will enable a feedback loop that helps control a patient's motion through alteration of the patient's music

# Features

1. Motion sensing through wearable hardware
2. Gait tracking digital processing (tempo tracking software)
3. Music tempo variation – utilizing feedback to control desired outcome
4. A user interface that allows music genre selection
5. Rechargeable battery power

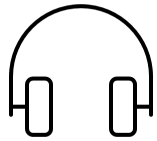
# Available Technology



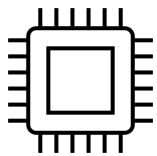
Motion Sensor



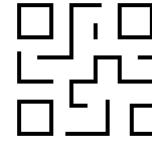
Wearable Clip



Headphones



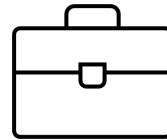
ESP32 C3 WROOM



Other Board Components

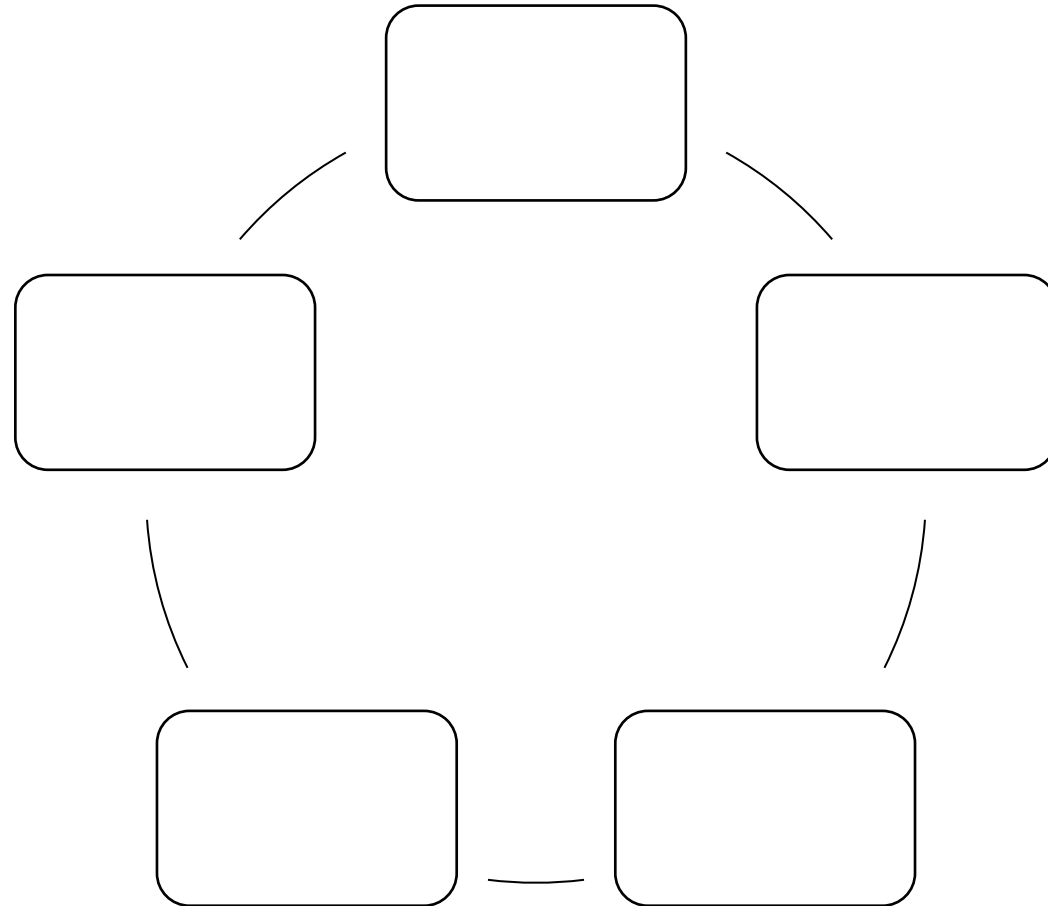


Rechargeable Battery



Case to enclose wearable

# Engineering Content



# In Conclusion

## Our Solution



A wearable device that tracks and analyzes the gait of a patient



Use this analysis to curate a music experience in the genre selected by the patient that effectively stimulates improved motor function

## Why it Matters

- Many people face the difficult reality of declining motor function
- Many existing treatments are incredibly expensive and invasive
- Our simple solution has the potential to be accessible and affordable for many



