Developing a Transcranial Magnetic Stimulator Demonstration for Educational Purposes

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Background

- Transcranial Magnetic Stimulation (TMS) is a treatment for several neurological conditions
- TMS uses a series of short magnetic pulses directed to the brain to stimulate neurons via electromagnetic induction.
- The physics behind the treatment is difficult to explain to patients without relevant background.

This project aimed to solve challenges faced by clinicians in educating TMS patients during the informed consent process.

TMS Educational Prototype

- Miniature prototype of the TMS device and a representative model of a brain
- Demonstrates electromagnetic induction visually and interactively
- Created using off-the-shelf components and rapid prototyping methods

Features

- **mini-TMS device** that mimics a real TMS device
- **Brain model** to model neurological effects of TMS
- Electromagnetic coils and circuit to generate time-varying magnetic fields.
- The mini-TMS has a speaker and built-in settings that imitate TMS stimulation and suppression protocols.
- Moves when triggered by the mini-TMS to teach patients about motor threshold
- LED strips light up when triggered to showcase neuron network

Future Use

- The prototype will be used during the consent process through pre-created videos or live during consultation with patients.
- There is potential for research in understanding how informed consent is related to TMS treatment outcomes.
- The prototype design can be open-sourced to allow other clinics to build their own.

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