

# INDIVIDUALIZED BRAIN STIMULATION

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## Background

Major Depressive Disorder (MDD), also known as depression, is one of the most common psychiatric disorders and a leading cause of global mental and physical disability [1]. Traditional treatments such as antidepressants and psychotherapy have been implemented worldwide to mitigate this issue. Recently, tDCS (transcranial direct current stimulation), have emerged as a new promising depression treatment using non-invasive weak electrical current to the scalp.

## Requirements

- A mobile application collecting patients' data to build an individualized neurological profile
- A method of matching said neurological profile to proven tDCS treatment protocols based on published papers
- A method to continuously update treatment method when patients' data changes over time.



## Highlights



**Published study revision:** Manually review 70+ tDCS and depression related papers to extract 20+ proven treatment protocol

**Depression scale normalization:** Derive Plato Scale from popular depression scale normalization (PHQ-9, BDI-II, MADRS, etc.) using AI

**Treatment matching:** Recommend tDCS protocol of the top 3 most valued papers based on input weight configuration for parameters (effectiveness, study duration, etc.)

**Mobile Application:** Redesign and build a new mobile application from scratch implementing individualized tDCS treatment recommendation.

## Deliverables

- 20+ study proven tDCS treatment protocol from 70+ papers revision
- A method of normalizing depression scales and recommend tDCS protocols
- A treatment recommendation mobile application based on users' depression conditions

## Functionalities

- Authentication with email verification
- Individualized assessment through depression severity questionnaires
- Computation and normalization of different depression severity scales to a common Plato Scale using AI
- 28-day tDCS treatment protocol recommendation to later be used with tDCS headset
- Everyday check-in questionnaires to monitor user's progress and condition

