



## USER'S MANUAL

## Hardware

1. 3D printed SMILE headband with built-in EEG measuring electrodes.
2. USB Bluetooth dongle
3. Power cord (mini-USB)

## Software

1. Go to <https://github.com/gregmedlock/SMILE/> and download the folder named "SMILE User". Place this folder in your MATLAB path.

## Getting Started - Putting on a SMILE

1. Turn on SMILE by flipping the switch located on top of the rectangular module marked "POWER". A blue light will indicate that SMILE is on.  
  
(!) If the light does not turn on, the battery is likely dead. Plug in the device using the charging cable. A red light will indicate that SMILE is charging. *Do not use SMILE while charging.*
2. Place SMILE on your head with the rectangular modules toward the back of your head. You should see three fabric electrodes at the front of the device. The middle electrode should be aligned in the center on your forehead.
3. Plug the USB dongle into your computer.
4. Open MATLAB and run the file 'SMILE\_main.m' located in the 'SMILE User' folder.
5. SMILE optimizes your use through a machine learning algorithm. Follow the program instructions in the command prompt. There are 4 running modes: 'Learn', 'Test', 'Run', and 'Demo'

'Learn' — The program will ask you to indicate your mental state (negative, positive, or neutral). This is how it calibrates to a new user. Approximately 50 inputs should be given to the program before using 'Test' mode.

'Test' — The program will attempt to guess your mental state, and ask for feedback. This mode continues to apply machine learning to improve its ability to predict your mental state, and will be useful in ensuring that SMILE is working for you before using 'Run' mode.

'Run' — The program will guess your mental state and provide biofeedback to you via audio. No machine learning is active here, and as such this mode should be used after using 'Test' mode to validate SMILE's efficacy.

'Demo' — Runs the demonstration script we used for showcasing to the industry panel. The program makes and averages six recordings to guess mental state. Implements a decision tree from prior machine learning.