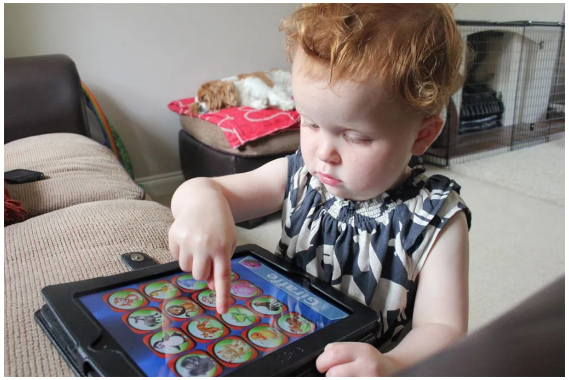
Crew X

Concentration

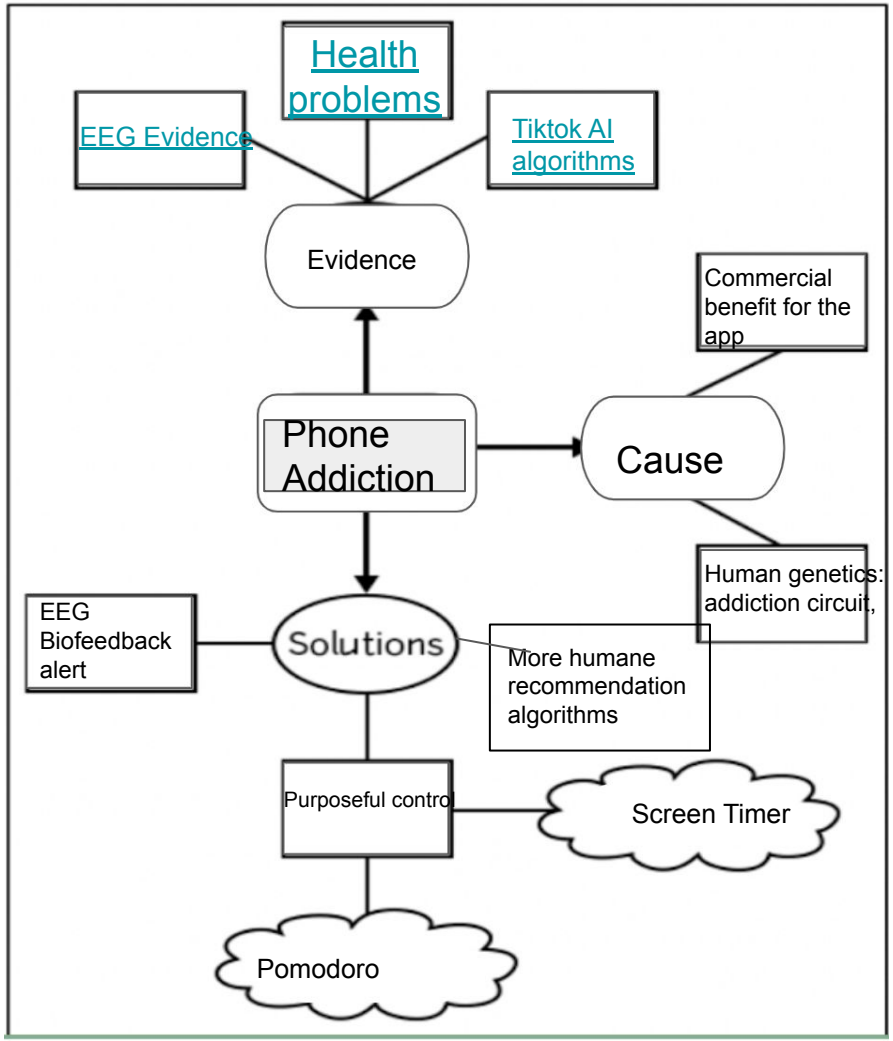
Phone Usage

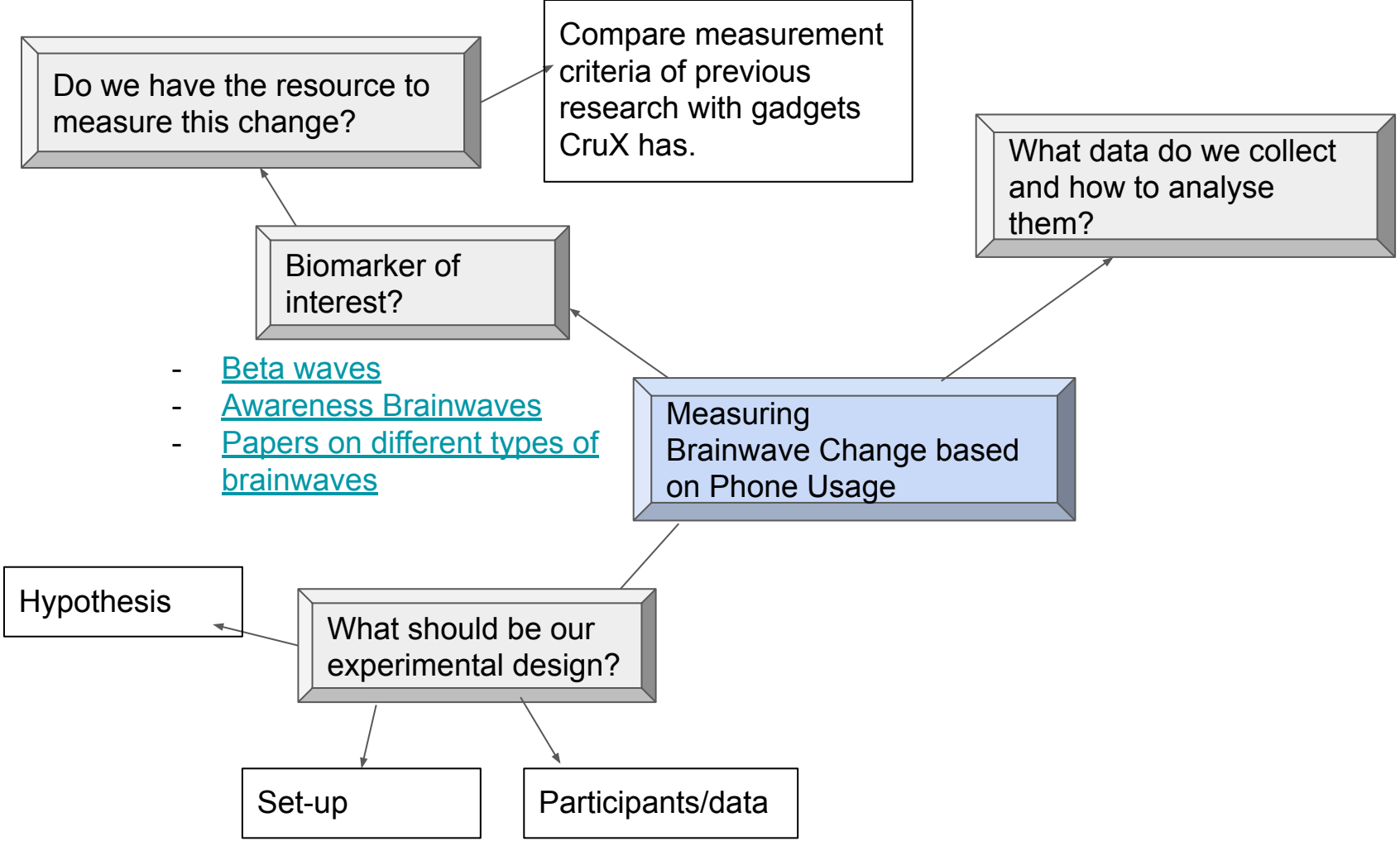
Addiction?



Wavelength?

ByteDance


Health problems
EEG Evidence
Tiktok AI algorithms
Evidence
Commercial benefit for the app
Phone Addiction
Cause
Human genetics: addiction circuit,
EEG Biofeedback alert
Solutions
More humane recommendation algorithms
Purposeful control
Screen Timer
Pomodoro


Measuring Brainwave Change based on Phone Usage
Biomarker of interest?
Do we have the resource to measure this change?
Compare measurement criteria of previous research with gadgets CruX has.
What data do we collect and how to analyse them?
- Beta waves
- Awareness Brainwaves
- Papers on different types of brainwaves
What should be our experimental design?
Hypothesis
Set-up
Participants/data

Current literature

Types of waves

- Beta waves
- Awareness Brainwaves
- Papers on different types of brainwaves

Waves specific to Phone usage

- Phone usage EEG Microstates ? what are microstates
- Addiction Brainwave and Phone usage
- Emotional Stability EEG and phone usage

Papers on the neurofeedback practice

- Neurofeedback training

CruX Headsets

Project summary

Develop an **EEG brainwave pattern recognition system** that alerts users when they lose focus/motivation/awareness scrolling through an addictive app. This is a relevant issue to most students and people in society, and potentially helpful in the prevention of phone addiction especially in children.

Experimental setup?

The participant will sit and watch ~30 minutes of Tik-tok videos on their phone nonstop. We mount the headset on them during the entire time when they are watching. We time the duration of them streaming tik-tok (a). After 30 minutes, we ask them how much time has passed, how much motivation they feel, and how much control they feel like they have (b). The control group will be book reading (? not sure if this is a good enough control) for the same amount of time and all other parts of the protocol remain the same.

Post experiment: Analyze brain waves over the 30 minute time frame. Find out:

1. Changes in frequency of beta waves, alpha waves, gamma waves
2. Timestamp of change
3. Correlation between self-proposed control and actual concentration

Research about waveforms/frequencies associated with control/motivation/concentration.

Data

High time resolution, low spatial resolution.

File Loading

Signal Filtering

Our focus frequency is 13-40Hz (Concentration); 25-100Hz(Learning)

We would perform bandpass filters, and other filtering techniques that we will research about.

Feature Extraction

We will perform FFT on our filtered signal to identify the major frequencies in play.

We will be looking for beta waves (Concentration) and gamma waves (Learning).

Dimensionality

Frequency from all the nodes,

Classification