



Problematic Internet Use: Mental health detection based on physical activity



Child Mind
Institute

Capstone Proposal

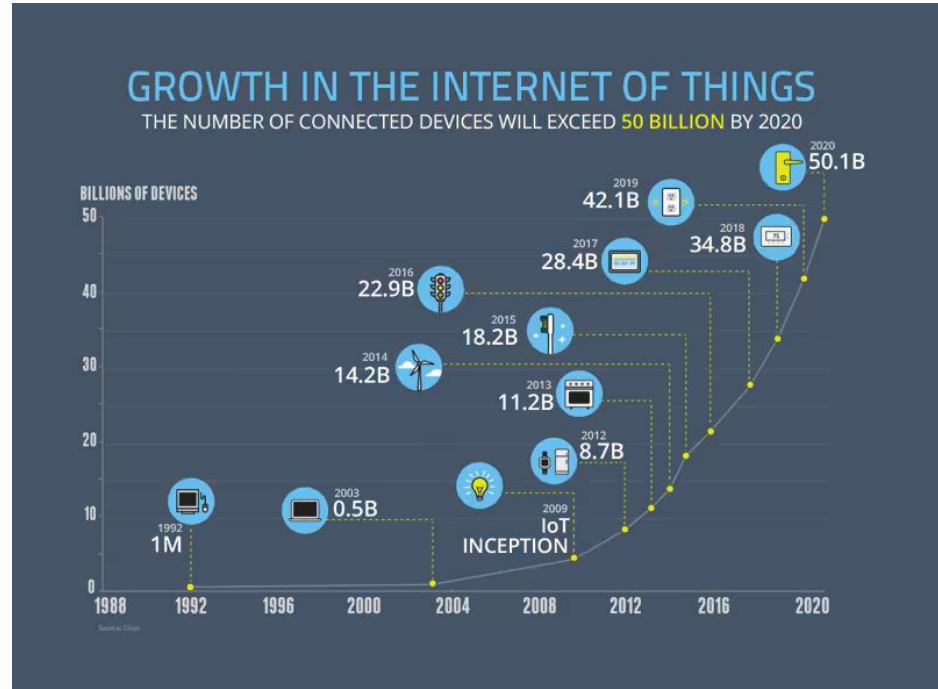
By: Daniel Epstein

Email: daniel.tepstein@gmail.com

THE
Community
TECH

Background

Over the last few years with the rapid development of the internet, access to the internet and generational gaps in the understanding of the internet, Problematic Internet Use, PUI, has become a serious issue.



Background

- PIU is now increasingly being recognized as a public health concern.
- It goes undiagnosed
 - Relied on complex evaluations
 - Inferred from related behavioural and emotional issues



Background

The Healthy Brain Network (HBN)

- Publicly and privately funded research study
- Transforming the way scientists study mental health
- How families access treatment and support

Goal

- Discover **biological markers** that support more objective, data-driven approaches to diagnosing and treating **psychiatric and cognitive conditions**.

Data

- HBN created a Kaggle competition to develop a predictive model capable of analyzing children's physical activity data to detect early indicators of problematic internet and technology use.



Background

- Physical activity and fitness measures
 - Easily captured through wearable devices and routine health assessments
 - Require minimal clinical oversight
 - Widely applicable across diverse populations.



Objective: To develop predictive models that leverage multimodal data from the Healthy Brain Network (HBN) to improve the identification of mental health and learning disorders in youth caused by PIU.

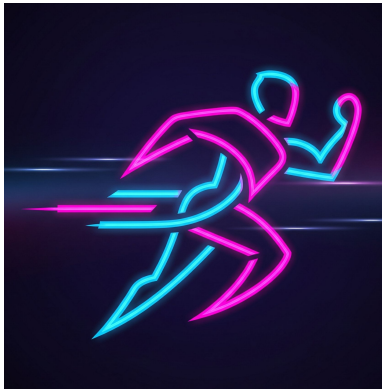
Problem Statement: How can data science be used to analyze data from physical activity and predict problematic internet use and mental health issues?



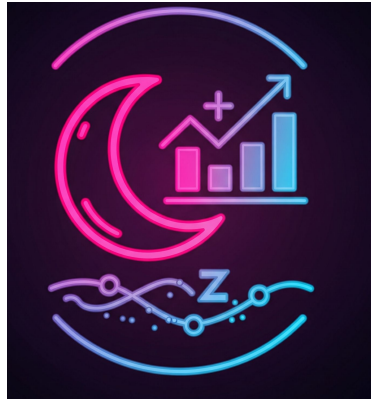
Methods

Analysis of physical performance and sleep data for different ages, genders, and body types. The data will be contrasted with the questionnaires around internet use to determine predictors.

Physical Performance



Sleep Data



Questionnaire



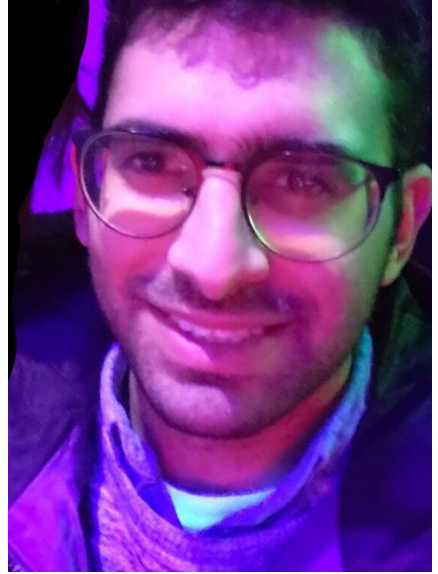
Dashboards

A Power BI dashboard will be provided to show physical and behavioral markers associated with Problematic Internet Use (PIU). The dashboard will visualize correlations, relationships, and group differences, enabling clear interpretation of how physical activity and other variables relate to PIU risk.



Inspiration

- I spent the last year working in a school with children aged 11 and 12 as a teacher's Assistant
- In my role I didn't have the same authority as a teacher and i was a fly on the wall much of the time
- As a fly on the wall the students would speak freely around me
- They spoke about many inappropriate things, mentioned self harm, the hours they spent online, and the secret chats they had amongst themselves that their parents weren't aware of
- On a less serious note the way they spoke was very much influenced by influencers and video games, and even the way they presented class projects was reminiscent of YouTube videos



- This HBN dataset includes approximately 5,000 participants aged 5 to 22, each of whom has undergone extensive clinical and research assessments.
 - The goal of this competition is to predict a participant's Severity Impairment Index (sii), a standard measure of problematic internet use.
 - Note that this is a Code Competition, in which the actual test set is hidden. In this public version, we give some sample data in the correct format to help you author your solutions. The full test set comprises about 3800 instances.
- <https://www.cihi.ca/en/patient-cost-estimator>