Problematic Internet Use: Mental health detection based on physical activity

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Background: Problematic internet use (PIU) among children and adolescents is an increasingly recognized public health concern. Traditional methods of assessing PIU rely on complex evaluations. Therefore, PIU often goes undiagnosed, with its effects instead being inferred from related behavioral and emotional issues. In effect too late. In contrast, physical activity and fitness measures, such as step count, sleep patterns, and body composition, are easily captured through wearable devices and routine health assessments. These objective metrics require minimal clinical oversight and are widely applicable across diverse populations. The Healthy Brain Network (HBN) works on discovering biological markers that support more objective, data-driven approaches to diagnosing and treating psychiatric and cognitive conditions, such as PIU. The dataset provided by HBN includes approximately 5,000 participants aged 5 to 22, each of whom has undergone extensive clinical and research assessments. The data provided consists of 3981 anonymized participants and related data related to their physical exercises, sleep questionnaire responses, and internet usage. *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. The primary goal is to identify physical biomarkers that can classify individuals as being prone to problematic internet use. *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.

Focus areas we will be looking to identify to deliver on our objective:

- Does season play a role in mood and physical activity?
- Will age or gender be a factor?
- Are standardized tests a good benchmark in order to predict PIU?
- How do we factor in people of different sizes or athletic abilities?

Links:

1. Source Dataset: LINK
2. Project: LINK
3. PPT Proposal: LINK