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Unveiling The Breath of Digital Dependency: Leveraging Artificial Intelligence to Detect Respiratory Changes Amid Mobile and Its Content Addiction

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For several years, Number of studies on the links between excessive mobile phone use and mental hearth has been increased.The aim of the study was to establish if there's a relation between mobile Phone addiction and depression in University Students.The general behavioral survey guided by well-structured self-designedquestionaries has been administered across 54 students.The questionaries are comprised of 23 items cSampling method. The parameters that were considered to measure the addiction is sleep distraction during sleeping and hours of daily use of mobile phone use.Implementing Supervised leaving SVM, Naïve Bases and RF. The article tries to highlight how minds are impacted by this phenomenon using Supervised Learning.Alcohol is not only an addiction, the undesirable changes in mind are also addiction which are highly affected by breathing process.
Keywords: SVM, Naïve Bases, Supervised Learning.

1. Introduction

Over the span of a mere few decades, smartphones have achieved widespread prevalence, transcending geographical and demographic boundaries. Their swift integration into society can be credited to their compactness and versatile capabilities, providing features like web browsing, email accessibility, seamless social media engagement, instant broadcasting,

camera functionality, navigation systems, and multimedia playback options. As of 2022, China had over one billion internet users, more than any other country in the world. India ranked second, as close to 933 million Indians accessed the internet via any device.

[1]The impact of internet usage has greatly transformed our lives across various dimensions. It permeates every aspect, from our social interactions to banking practices, from booking transportation to traveling arrangements, and from engaging with social media to participating in e-commerce. The convenience of accessing the internet through smartphones and the advancement of technologies like 4G, which offer high-speed connectivity, have accelerated these changes. With reliable and swift internet connections, buffering becomes obsolete, allowing for uninterrupted and seamless browsing experiences.

[2]The advent of smartphone technologies has captured the attention of the masses, leading us to utilize the internet more extensively on a daily basis than initially anticipated. People have developed a profound attachment to their smartphones, feeling an inseparable bond with these devices.

[3]This phenomenon is particularly amplified among the younger generation. India has over 1.2 billion mobile phone users and 600 million smart phone users.

[4] According to a survey conducted by the Mobile Ecosystem Forum from November to December 2019, the highest penetration rate among smartphone users was in the age group of 16 to 24 years, with 37 percent. This was followed by the users between 24 and 35 years old.

[5]The considerable use of smartphones before retiring for the day has been demonstrated by numerous studies that have a detrimental impact on the quality and extent of restfulness one receives during sleeping hours. It is therefore suggested that utilizing smartphones before bedtime be minimized in an attempt to attain superior, enriching slumber. Here are some key brain structures involvesduring sleep: thalamus, hypothalamus, pineal gland, brainstem, Basal Forebrain, Amygdala. For humans to enjoy proper restful periods of NREM and REM sleep, specific bodily structures have to work in sync. The dynamic duo regulates our sleeping patterns by coordinating different functions involved in keeping our bodies healthy. This includes crucial processes like hormone regulation for optimum vitality; memory consolidation for better retention capabilities; brain function regulations – all achieved through complex interactions between these numerous body components.

Compulsive sexual behavior (CSB) and excessive mobile use can be linked in some cases. Smartphones provide easy access to a vast amount of sexual content including pornography, dating apps, or explicit messaging platforms, which can lead to excessive engagement with sexual activities. This is due to the convenience and anonymity of mobile devices.

2. Related Works

Average internet usage on an average daily is 3hrs [1]. According to Dave Chaffey, 90% of the time is spent utilizing different apps while online, and 10% is spent visiting different websites. [6]. Utilizing social media sites like Facebook, Instagram,YouTube has been linked to addiction, lower academic performance and irregular sleep schedule [7]. This high affinity for online and smartphone access has led to the generation spending days engrossed in internet

and smartphone.

In fact, if we merely monitor people in public locations such as airports, restaurants, and shopping malls, we will see that a considerable number of them are occupied with their cellphones. This high affinity for online and smartphone access has led to the generation spending days engrossed in internet and smartphone. In fact, if we merely monitor people in public locations such as airports, restaurants, and shopping malls, we will see that a considerable number of them are occupied with their cellphones. This is leading to internet/smartphone addiction. Prior studies define technology addiction as " an obsessive pattern of IT- seeking and IT use behaviors that takes place at the expense of other important activities", leading negative psychological , behavioral and cognitive consequences Survey shows tremendous growth of about 84% on smartphone usage from 2014 to 2016. Smartphone addiction not only creates stress, reduces satisfaction of life and also negatively impacts academic performance. [8] [9]

3. Methodology

3.1 Participants: -

Data was collected from 56 students (RAVENSHAW UNIVERSITY and some other institutes); in India. During this online survey, the confidentiality of participants is maintained and the purpose of this survey is discussed clearly with participants. This dataset consists of 32 male and 24 female participants.

3.2Measure: -

The survey comprised two distinct sections. The first one is the demographic section which consists of personal details like the name of the participant, age, gender, contact number, and Institute name. The second section consists of information regarding their daily mobile use time and how other activities are affected by the use of mobile. The responses of participants are collected on a six- point scale, from "strongly agree" to "strongly disagree". The level of measurement of items lies in a metric from 1 to 5.

Table1: Attributes of participants collected from survey questions.

Demographic	SAS
Name of participant	Does the use of your smart phone interfere with your sleeping?
Age	Do you ever feel remorse about the way you use your smart phone?
Gender	Does your use of a smart phone boost or lower yourself- esteem?
Educational institute	Doyou lose time from school, college and university or other Institutions because of your use of a smart phone?
Contactnumber	Doyou try toschedule or control the use of your smartphone but find that you reallycannot?
-	Do you feel an obsessive urge to use your smart phone to escape feelings of boredom or loneliness?
-	Doyou crave your smartphone aftera short time without it?
-	. Do you feel it would be almost impossible to live without The uncontrolled use of your smart phone?

-	How many hours do spend on your phone daily?
-	. Do you normally stay online longer than youintended
-	Do you see excessive screen time as a problem
-	Do you think the cell phone hold you back from being productive
-	Does use of telephone make you restless
-	Do you think use of mobile affect your relationship with family andfriends
-	Do you use mobile while having bath, having food, during riding bikes?
-	Do you feel an urge to use your smart phone as soon as you awaken?

The questions were designed according to the uses of smartphones among students to understand their usage patterns, preferences, and attitudes toward mobile technology and its effect on their daily schedule. The correlation matrix of the dataset is represented in the figure 1.

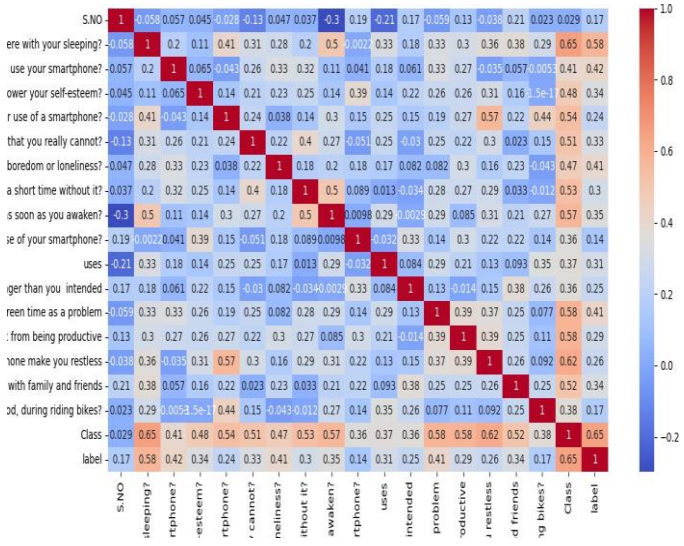

Figure 1 : correlation matrix

3.3 Data Analysis: -

Data pre-processing techniques were used to balance data [11]. Different classification techniques were used to measure the accuracy and f1 score of the designed model. The classification techniques used were Support Vector Machine, Random Forest and Naïve Bayes classifier. Support vector Machine and Naive Bayes classifiers provide good results as tested in other mobile phone addiction datasets. The performance of classification models was evaluated using f-measure and accuracy metrics as shown in tabel-1. The confusion matrix of training and testing shows in figure 2 represent the testing result.

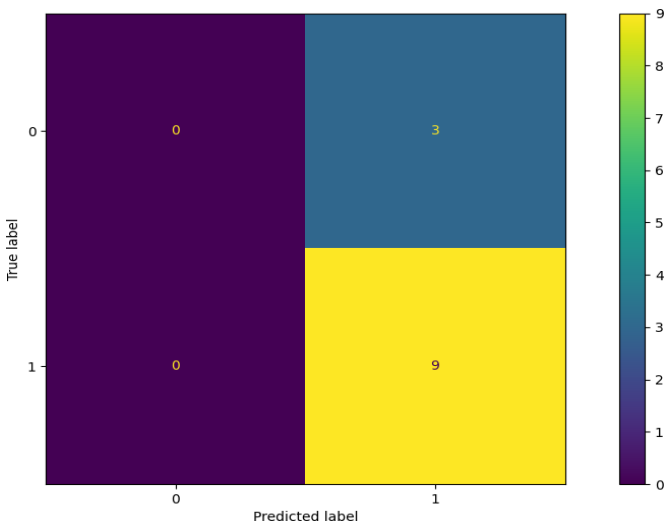

Figure 2: Confusion Matrix

Table 1: accuracy and f-measure score of classifiers

Classifiers:	SVM	Naïve Bayes	RandomForest
Accuracy	75%	83%	91%
f-measure	94%	90%	94%

Table 2 : total error and mean absolute error obtained in classification model.

	SVM	Naïve Bayes	RandomForest
Total error	0.25	0.16	0.08
Meanabsolute error	0.25	0.08	0.08

4. Result

The data trials generate some extremely interesting and valuable results. From the survey report, we found that 63% of the participants have smartphones interfering during their sleeping hours and 87% of participants plan their screen time but fail to stick to it due to distractions. 68% participants face excessive screen time as a problem.

Classification techniques used to predetermine students' sleep disorder due to overconsumption of mobile phone gave good results as shown in Table 1. Mobile using time of participants was divided into four categories: low, average, high, very high. The attributes used for determination of addiction of mobile phone was smartphone addiction scale, hours of mobile use, problems faced by them for using mobile phone for excessive time. The line graph shows the result of addicted and non-addicted student in a graph.

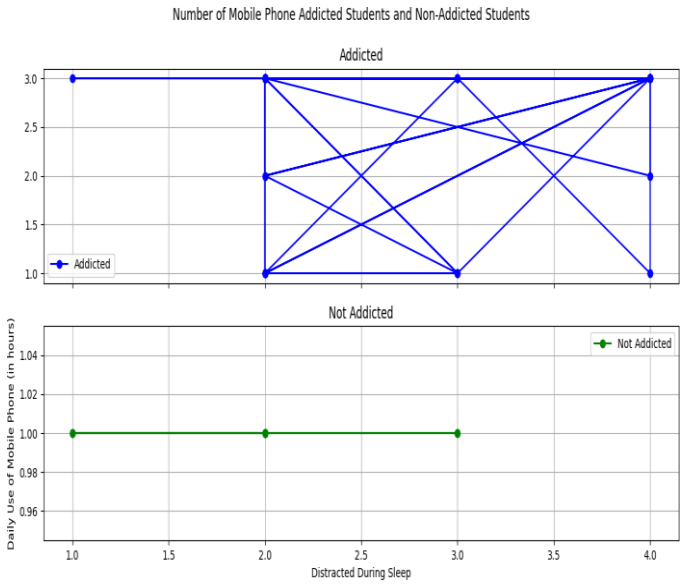

Figure 3:number of students addicted vs not addicted students

Table 1.1: Heart rate

TIME	STUDENT-1		STUDENT-2		STUDENT-3		STUDENT-4		STUDENT-5		
(IN SEC)	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	Z-VALUE
1 min	130	105	134	117	118	102	134	122	122	108	±3.339
3 min	125	100	122	116	144	120	140	117	134	116	±3.816
5 min	115	98	112	98	126	108	119	102	114	108	±2.862
7 min	135	100	136	116	120	100	112	102	102	98	±4.452
10 min	120	100	112	98	112	100	125	98	113	99	±3.5381

Table 2.2: Systolic BP

TIME	STUDENT-1		STUDENT-2		STUDENT-3		STUDENT-4		STUDENT-5		
(IN SEC)	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	Z-VALUE
1 min	114	90	154	143	127	118	126	92	130	102	±4.214
3 min	150	118	130	119	120	113	132	106	136	118	±3.737
5 min	127	130	118	110	115	108	114	104	142	103	±2.425
7 min	120	118	114	112	127	109	140	112	118	100	±2.703
10 min	115	108	115	108	117	113	116	102	115	92	±2.186

Note: Data analysis with reference to the record of heart rate, S. BP, D. BP, Oxygen level, before and after practice of "PRAJNANA ASANA" with a varying practicing time frame from 1min - 10mins.

Table 3.3: Diastolic BP

TIME	STUDENT-1		STUDENT-2		STUDENT-3		STUDENT-4		STUDENT-5		
(IN SEC)	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	Z-VALUE
1 min	75	65	70	68	72	68	69	66	77	68	±1.113
3 min	65	60	75	72	74	69	70	68	75	71	±0.755
5 min	70	62	80	78	68	63	70	66	68	62	±0.994
7 min	67	66	70	68	66	61	69	65	70	64	±0.716
10 min	69	64	76	64	76	75	69	63	74	68	±1.193

Table4.4: Oxygen level

TIME	STUDENT-1		STUDENT-2		STUDENT-3		STUDENT-4		STUDENT-5		
(IN SEC)	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER	Z-VALUE
1 min	95	99	95	100	98	99	90	97	95	107	0.954
3 min	96	98	98	99	92	97	88	94	99	106	0.835
5 min	97	100	96	99	96	98	102	104	93	100	0.676
7 min	95	100	95	98	93	101	87	100	102	106	1.312
10 min	95	98	97	99	90	100	94	102	104	108	1.073

DATA ANALYSIS WITH REFERENCE TO THE RECORD OF HEART RATE, S. BP, D. BP, OXYGEN LEVEL, BEFORE AND AFTER OF PRACTICE OF "PRAJNANA ASANA" WITH A VARYING PRACTICING TIME FRAME FROM 1 MIN - 10 MINS.

5. Key Observations

As we can observe from the test data, the Heart rate (Table 1.1), Systolic BP (Table 2.2), Diastolic BP (Table 3.3) were significantly reduced with an average Z-value of 3.60,

3.05 & 0.95 respectively. The oxygen levels (Table 4.4) were found to increase with an average Z-value of 0.97; after practicing "PRAJNANA ASANA".

Conscious breathing followed by rhythmic inhalation and exhalation had a remarkable impact in lowering down the beating rate of the heart that subsequently reduces stress due to anxiety.

Surprisingly, the after effects of suppression of certain sort of emotions affects our bodily metabolisms resulting increased blood pressure level and heartbeat that is in a bunch of students arguing with each other with an intent of proving their notions to be correct, the one with almost no participation was recorded to have maximum stress due to anxiety that was because of suppression of expression.

When aerobics or any physical exercise was synchronized with a controlled breathing pattern that is traditionally well revered as "ASANAS" it gave rise to lowering of breathing rate followed by blood pressure.

6. Results

The exercise-induced alterations in these metrics were significantly smaller after one month of Yoga training compared to their pre-yoga training response.

7. Discussions

According to the World Health Organization, health is a condition of complete physical, mental, and social well- being, not only the absence of diseases.

Because health is a state of relative equilibrium between a human and its surroundings, it may be altered by a variety of

elements such as exercise, yoga, personal hygiene, food habits, sound sleep, and behavioral patterns. The current study sought to ascertain whether Yoga instruction modifies cardiovascular responses to exercise and their time course following exercise.

8. Conclusion

It is found that following Yoga training, a given level of exercise results in a gentler cardiovascular response, implying improved exercise tolerance. Exercise and asana increased heart rate (HR), systolic pressure, pulse pressure, and decreased diastolic pressure significantly.

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