# CSED Group 11 Semester 2 Report

## Computing as a Science and Engineering Discipline (CM10251)


Allington, Mathew
mma82@bath.ac.uk

Draper, Tom
td544@bath.ac.uk

Foot, Aethan
ajf75@bath.ac.uk

Ito-Low, Alexander
ail24@bath.ac.uk

Millischer, Christophe
cm2307@bath.ac.uk

Mortensen, Soren
snm48@bath.ac.uk

Mortimer, Lloyd
lm2062@bath.ac.uk

Sogbesan, Samuel
ss3222@bath.ac.uk

Songthammakul, Ravit
rs2347@bath.ac.uk



**Abstract**



Supervised by:

Hyde, Jo
cssjkh@bath.ac.uk

# Contents

# 1 Introduction

## 1.1 Overview of Domain

Personal informatics is a term used to refer to devices and software that help people gather information about themselves, so they can reflect upon it and gain motivation to make changes to their lifestyle and habits to improve their overall wellbeing. Personal informatics is used for effectively motivating people to gain self-knowledge, change behaviours.

The area of personal informatics has started to explode in popularity in recent years mainly due to the increased availability and usability of affordable hardware. Consumer products such as the FitBit and Apple Watch allow users to collect data on a wide variety of metrics including heart rate, blood pressure, motion and many others. Products such as the Neuroon, a wearable EEG eye mask, and Zeo Sleep Manager Pro, an EEG headband, allow the user to collect information on brain waves for the purpose of sleep tracking.

Another factor that has contributed to the growth of personal informatics is the ubiquity of smartphones, meaning that users have an ever-present device that allows them to collect and collate data from their personal informatics hardware. Many personal informatics apps also add an element of socially driven competition and gamification, driving users' motivation to continue to use them and push their friends to also begin using this technology. In addition, there is a larger social force pushing people to take steps to improve themselves.

## 1.2 Challenges

### 1.2.1 Privacy and Security of Data

### 1.2.2 Health Risks

One crucial problem in the realm of health is sleep deprivation. Sleep deprivation is defined by British Medical Association (2018) as "a lack of sufficient sleep resulting from disruption to the natural sleep cycle". This is important to highlight because as as opposed to fatigue, sleep deprivation isn't subjective. In accordance to Alhola and Polo-Kantola (2007), it was estimated that the main effect of sleep deprivation was the reduction in cognitive performance. This includes: impaired attention; longer delays in making decisions; poor quality of decisions and a reduction in long memory. This is especially important to monitor for individuals who have high risk jobs. In 2010, passenger's lives were lost when a plane overshot the runway by 600 meters; although concrete details haven't been exposed, it was claimed that the accident unfolded due to the pilot's severe sleep deprivation (BBC, 2010). Even in circumstances where the individual isn't responsible for people's lives, a reduction in cognitive performance is still observed. Hence, the validity of this problem is justified.

## 2 References

Alhola, P. and Polo-Kantola, P., 2007. Sleep deprivation: impact on cognitive performance. *Neuropsychiatric Disease and Treatment* [Online], 3(5), pp.553–567. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2656292/.

BBC, 2010. *Air india plane crash: 'sleepy' pilot blamed* [Online]. Available from: https://www.bbc.co.uk/news/world-11772562.

British Medical Association, 2018. *Fatigue and sleep deprivation—the impact of different working patterns on doctors* [Online]. Available from: http://bmaopac.hosted.exlibrisgroup.com/exlibris/aleph/a23_1/apache_media/E6Q21YYTL9GF3G9R5B1HDNPA8E51PT.pdf.