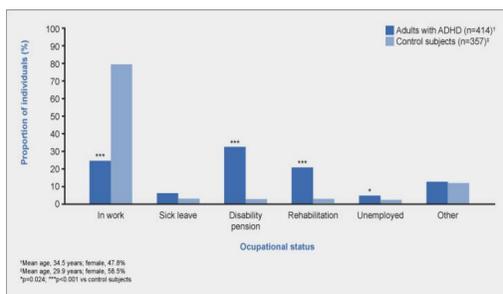
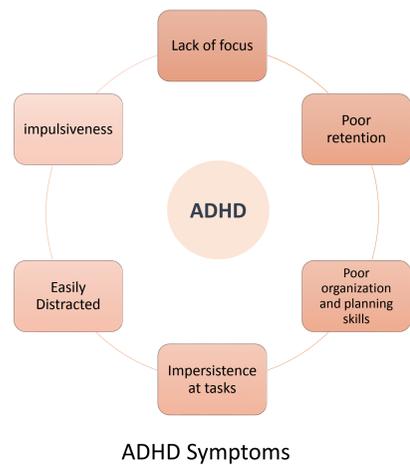




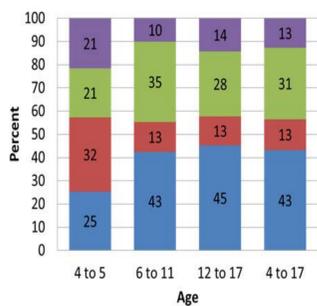
Shadan Shamel Derakhshan, M.Sc. Student of Computer Science (University of Victoria, British Columbia). Dr. George Tzanetakis, Professor of Computer Science (University of Victoria, British Columbia)

## 01 Background

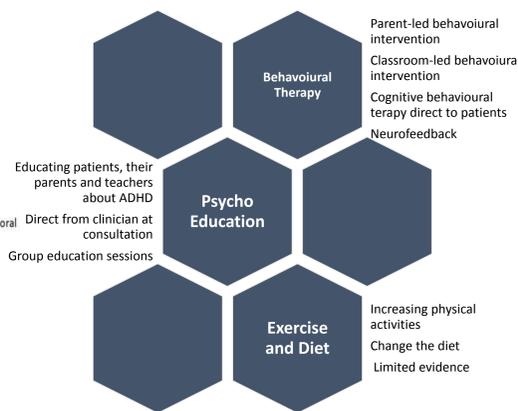
Attention deficit–hyperactivity disorder (ADHD) is characterized by symptoms of inattention and impulsivity. Pharmacological therapies are more prevalent while one of the best ways to reduce the symptoms is doing physical exercise. Many people with ADHD have a job, and one of the solutions to reduce the symptoms of ADHD in their workplace is allowing them to do some physical activities while they are working. In this project, a desk with stationary bikes will be used. Then, by using the heart rate of the users that is measured by the equipment that is a desk with stationary bikes, the effectiveness of the equipment will be investigated, and we will try to figure out the relationship between the heart rate of the users and productivity.



Many people having ADHD at work



Pharmacological therapies are more prevalence between people having ADHD



Non-pharmacological Therapies for people having ADHD

## 02 Objectives

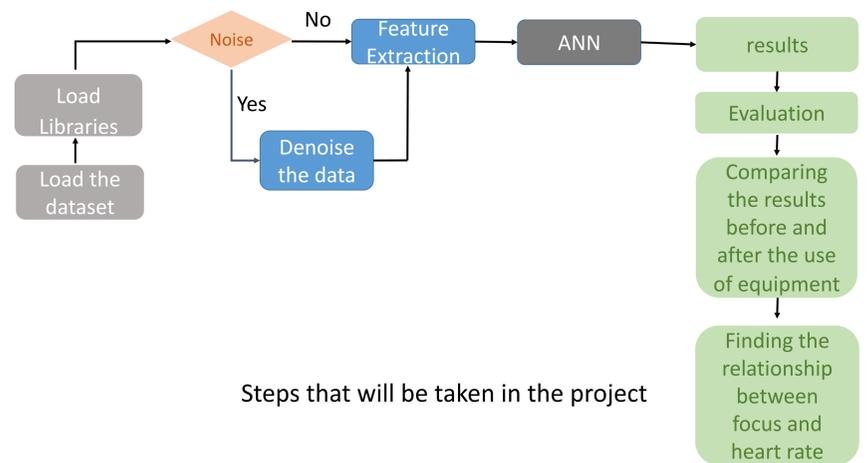
- To extract relationship between focus and productivity in ADHD patients' heart rates.
- To suggest a non-pharmacological way that helps ADHD patients to reduce the ADHD symptoms such as restlessness.



Introduced equipment to address ADHD patients difficulty in focusing at workplace

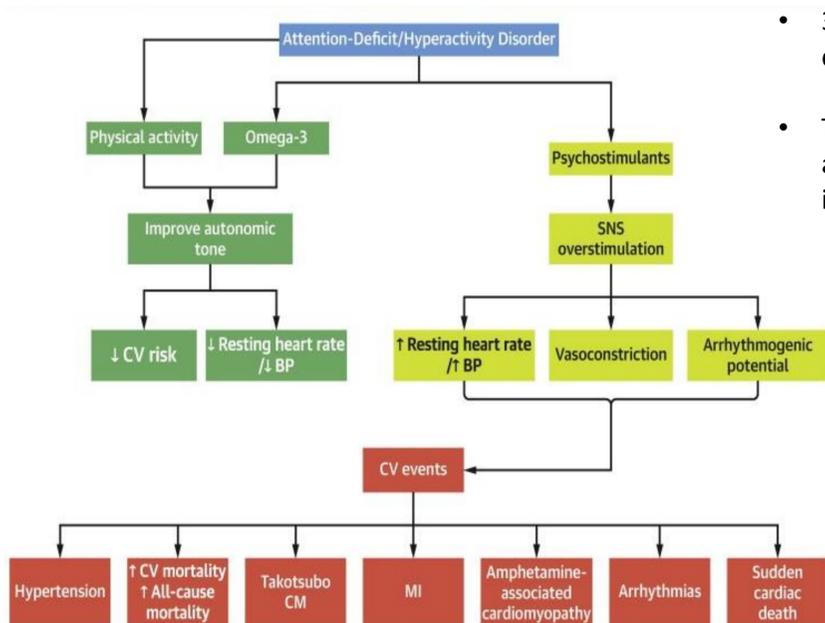
## 03 Method

The equipment that will be used is a desk with stationary bikes, which is one of the products of the Ergonomyx company. The equipment can measure heart rates. After measuring signals before and after the use of the equipment, as a part of preprocessing, the first step is to denoise the data by using noise reduction techniques. In the second step, some feature extraction techniques will be used to extract information of the heart rate of ADHD patients. Then, by using extracted information and Artificial Neural Network, the information about ADHD patients' heart rate before and after use of the equipment will be extracted and visualized. Finally, we can study the relationship between focus and ADHD patients' heart rate.



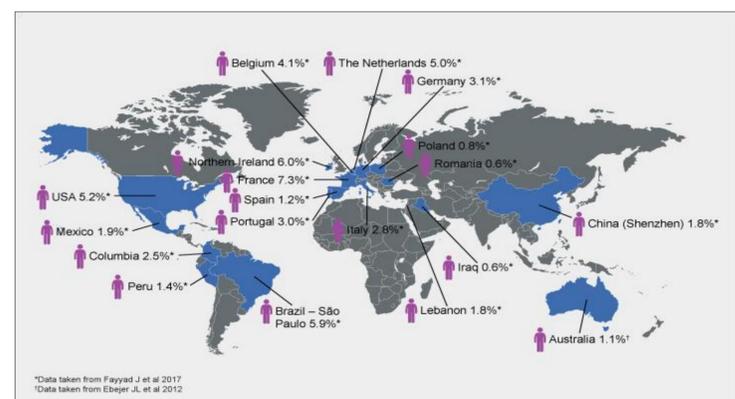
Steps that will be taken in the project

## 04 Significance



Risks of having cardiovascular events in different treatments for ADHD. As it can be seen, doing exercise is one of the safest treatments

- 3% to 5% of adults have ADHD around the world. People suffering from ADHD find it difficult to stay focused for long hours.
- The use of drugs for ADHD patients increases the risk of serious cardiovascular events, and it is proved that aerobic exercise can improve ADHD patients cognitive abilities. The introduced equipment can help patients to be more productive in their workplace.



Percentage of individuals with ADHD across the world

