Project Plan of the Internship Assignment

Internship organization

I have been selected to do an internship in the research branch of Holon Institute of Technology (HIT), where I will work in an AI medical lab under the Faculty of Sciences. The lab is dedicated to enhancing healthcare quality by utilizing new technologies in sensing and diagnosis to make the world a better place. You can learn more about the Faculty of Sciences at the official link: https://www.hit.ac.il/en/sciences/overview. The lab currently comprises six members, and I will be working independently under the guidance of the head of the lab, Dr. Blumrosen, during the initial weeks. However, additional support may be available to me later on. For more information about the lab, you can visit their website at https://gaddib.wixsite.com/hit-site.

Assignment

- Occasion and background
  - Mice are commonly used in preclinical research due to their genetic and behavioral similarities to humans. They are also easier to work with compared to larger animals, such as monkeys, and are less expensive to maintain. The behavioral analysis of mice is essential for evaluating the efficacy of potential treatments for autism spectrum disorders. However, the current methods used for analyzing mouse behavior are often limited by the subjective nature of observations, the potential for human error, and the labor-intensive nature of the process.
  - The University of Ben-Gurion has a dedicated team of researchers who are currently working on a project focused on studying biometric features of autism in mice. To support their research efforts, the team is seeking a software tool that can automatically classify these biometric features in mice. Such a tool would enable the researchers to process large volumes of data in a timely and accurate manner, allowing them to identify patterns and correlations that might be difficult to detect manually.
- Goals
  - The goal is to develop a software based on computer vision that can accurately recognize patterns of behavior disorders and interactions in mice. This software will leverage advanced machine learning

algorithms and data analysis techniques to improve the accuracy and efficiency of the diagnosis process. The software will be designed to automatically analyze video footage of mice in various environments and identify patterns of behavior that are indicative of autism spectrum disorders.
    - As the field I'll be working in is still in development and at the cutting edge of Computer Science, the exact software I'll need to use is undefined and unclear. My first step will be to gather as much information as possible and explore what's currently available on the market. Based on my research, I'll determine which tools and features I require and how I can leverage them to push the industry forward.
- Business case
    - By automating the analysis process, the software tool will significantly reduce the time and effort required for behavioral analysis, allowing researchers to analyze larger datasets and obtain more accurate results. Moreover, the use of machine learning algorithms will increase the accuracy of the analysis, reducing the potential for human error and improving the reliability of the diagnosis process.
    - The research being conducted by the team at Ben-Gurion University in collaboration with HIT Holon is not only addressing the need for more accurate and efficient analysis of mouse behavior but is also pushing the boundaries of science. By developing software that can automate the analysis process and leverage advanced machine learning algorithms, contributing to the advancement of the field and paving the way for new insights into autism spectrum disorders and other diseases and disorders that can be studied using mouse models. The development of more accurate and efficient methods for analyzing mouse behavior has the potential to lead to new discoveries and treatments for a wide range of diseases and disorders.

Planning

- To ensure productivity during my internship at HIT in Holon, I have broken down the period into weekly sprints, with specific goals for each sprint. At the end of each sprint, I will evaluate the results and adjust my planning for the upcoming sprints accordingly. In addition to the weekly evaluations, I will present my progress and receive feedback from Dr. Blumrosen when I have made significant progress. This approach will allow me to stay on track and ensure that the project is progressing as planned.
- For a more detailed and technical planning, please look on GitHub Projects.
- In short:
    - During the first few weeks of my internship at HIT in Holon, Israel, I will be focused on familiarizing myself with the HIT school and completing necessary documentation. Additionally, I will begin analyzing the data and exploring potential software packages that could be useful for the project.
    - Following this, I will apply the researched software to the data and analyze the results to ensure they align with our objectives. The next

step will involve classifying the results, which may require further iterations to achieve accurate classifications.
    - Finally, I will document my findings in a research paper detailing the methodology, results, and conclusions of the project.

Information collection and reporting

Dr. Blumrosen has requested that I provide updates on my progress when there is significant progress made or when there is uncertainty or if I have any questions. These updates will be given in person, via email, or via WhatsApp.

In addition, I will be maintaining a weekly report where I will document my daily work and progress. This report will serve as a record of my progress history and can be referred to at any time.

For project management tools, I will be using the following:

- Google Drive → for document sharing
- Zoom → for online meetings
- Clockify → for time tracking
- Outlook → Textual communication
- Whatsapp → Textual communication

Project organization

- I will be reporting to my mentor, Dr. Blumrosen.
- While I will be working independently for the initial weeks of the project, it is possible that I may receive additional assistance at a later stage during the internship. Should this occur, I will discuss the matter with my supervisor (Tinne) and document the details in my weelky reports.