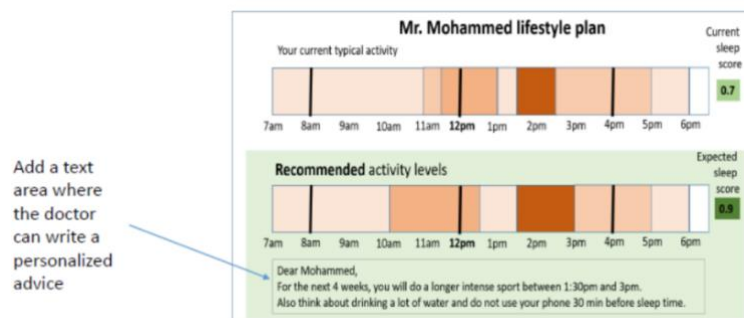


ActiSLEEP – Intelligent System for Recommending Physical Activities –

Project Description. We propose a smart system “ActiSLEEP” combining machine learning and interactive visualization to support a medical doctor and a patient to schedule physical activities and sleep to improve the wellness score of the patient. In this project, we propose to design a visual recommendation functionality to recommend change of activity for a patient to improve her sleep activity. The interface will allow the doctor to interactively change the sequence and level of activities. Thanks to data-driven models, the doctor will get indication on which change would better improve the quality of sleep of the patient and get an estimation of the improvement if the change were realized by the patient.

In a typical usage scenario, the patient is equipped with wearable activity sensors (e.g. Fitbit) that records her daily physical activities. When visiting the doctor with the doctor’s interface, or on her own with a personal interface, she can visualize a summary of the intensity level of her physical activities and sleep, and other biometrics data (weight, etc.), and sleep quality, in terms of one or several typical days (e.g., a week-day or weekend-day).

She gets *personalized recommendation* to improve her wellness score, by increasing or decreasing her level of physical activity interactively through the interface according to her own schedule and doctor’s recommendations. The system integrates these updates and computes the wellness score corresponding to the new schedule. After several updates, the patient and the doctor agree on the final schedule that becomes the new target activity plan. “ActiSLEEP” is an intelligent system, that is data-driven and user-centered. It integrates Zamanya (machine learning, data-driven models) with an interactive visualization interface.



Project Type. Engineering

Internship Batch: Batch 1 from May 7 to June 29

Duties/Activities. The core code of ActiSLEEP already exists, but there is still some work to be done to make it usable. Participate in the design, and coding, of a physical activity recommender system using machine learning. Determine the best technique, including advanced optimal transport metrics, for prediction in terms of accuracy and speed. Evaluate the results on benchmark data.

Required Skills: Python

Preferred Intern Academic Level: B.Sc. (3rd year or 4th year) or MS student.

Learning Opportunities. Students need not have prior knowledge about the eHealth concepts mentioned above. They will acquire new knowledge in machine learning and enhance their programming skills in Python and Bokeh.

Expected Team Size: 2 students

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