**Project**: Healthactivity recognition using active learning.

**Area:** Active Learning, Machine Learning.

**Date:** September 17, 2018

**People:** Vivya Kalidindi, Dr. Pradeep Chowriappa

**Objective:** To detect the health-care for humans ranging from personal fitness to elder care by increasing physical activity through sending automated personalized feedback using smartphones. With current technologies, this can be achieved automatically, without human interpretation. MyBehavior [2][3], a mobile phone app, automatically learns a user’s physical activity and dietary behavior and strategically suggests changes to those behaviors for a healthier lifestyle.

**Hypothesis:** MyBehavior app will not just suggest “Continue or increase your existing behaviors”, but it will also find where a user’s existing walking behaviors happen and tell the user specifically to walk at those locations. In order to achieve such personalization,user behaviors must be extracted in a principled wayof reinforcement learning [2], capacity for adaptive decision making is implemented using the explore-exploit principle using Multi Armed Bandit (MAB) [2][3] models.

**Alternative Hypothesis**

**Keywords:** Active learning, Activity recognition, Machine learning, Mobile phone sensing, Reinforcement learning, Multi-armed Bandit.

**Specific Aim:**

1. **Data Collection:** It can be done by using The MATLAB[5] Support Package for Apple iOS Sensors enables you to collect sensor data from your iOS device.
2. **Data Preprocessing:**
3. **Features of Interest:**
4. **Methodology**:
5. **Validation of Results**:

**Specific Aim worked during this report:**

**Key Accomplishment:**

**Red Flags:**

1. test
2. test

**Future Work:**

1. test
2. test

**Time Line:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **AIM** | **May 1st – May 8th** | **May 9th – May 15th** | **May 16th – May 22nd** | **May 23rd – May 28th** |
| **Data Collection and preprocessing** |  |  |  |  |
| **Feature Extraction** |  |  |  |  |
| **Proof of Concept** |  |  |  |  |
| **Additional Work** |  |  |  |  |

**References:**

[1] Anjum, A., & Ilyas, M. U. (2013). Activity recognition using smartphone sensors. In *2013 IEEE 10th Consumer Communications and Networking Conference, CCNC 2013* (pp. 914–919). https://doi.org/10.1109/CCNC.2013.6488584.

[2] Mashfiqui Rabbi, Min Hane Aung, and Tanzeem Choudhury. Towards Health Recommendation Systems: An Approach for Providing Automated Personalized Health Feedback from Mobile Data. *In: Rehg J., Murphy S., Kumar S. (eds) Mobile Health: Sensors, Analytic Methods, and Applications, July 2017, pp 519-542, Springer International Publishing.*

[3] Mashfiqui Rabbi, Min Hane Aung, Mi Zhang and Tanzeem Choudhury. [Automatic Personalized Health Feedback from User Behavior and Preference using Smartphones.](http://pac.cs.cornell.edu/pubs/ubicomp_mybehavior.pdf) *The 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing* ([Ubicomp 2015](http://ubicomp.org/ubicomp2015/)).

[4] Mashfiqui Rabbi, Angela Pfammatter, Mi Zhang, Bonnie Spring, and Tanzeem Choudhury. [Automated Personalized Feedback for Physical Activity and Dietary Behavior Change With Mobile Phones: A Randomized Controlled Trial on Adults.](http://mhealth.jmir.org/article/viewFile/mhealth_v3i2e42/2) *JMIR mHealth uHealth 2015;3(2):e42.*

[5] <https://www.mathworks.com/help/supportpkg/iossensor/ug/get-started-with-apple-ios-sensors.html>