*Sprint (22nd April-6th May)*

***Algorithm Team***

Members – William Hebblewhite (Data analytics Team Leader)

Shashvat Joshi (Project Lead)

Andrew Mayes

Langning Bao (Noah)

***Sprint Goals***

**P1 -** Aim: Research ML Algorithms to improve efficiency in incentives Problems

**P2 -** Aim: Research Fuzziness in relation to Algorithms and Game Systems

**Note – Details provided in Annexure A**

***Current progress of members during sprint***

|  |  |  |
| --- | --- | --- |
| **Member** | **In-progress/Completed** | **Current Goals During sprint** |
| William | Overview of the details, goals and problems related time-series regression algo. Completed | 1. Start with the   Sprint goals & submit deliverables mentioned below |
| Shashvat | Working on O2 Predictive models + reports and will show the models to Team Leader next week & then start the Reviewing/ testing phase on the selected model. (In progress) | 1. Finish Testing model & creating test Report and deploying of model 2. Start with the   Sprint goals & submit deliverables mentioned below |
| Andrew | Working on the LSTM research and updating model with new data + improving accuracy of the model.  (In-progress) | 1. Finish Report Reorganize all Data into One database 2. Start with the   Sprint goals & submit deliverables mentioned below |
| Noah | Working on research and building and training a predicting model of BMI and / or Metabolism | 1. Research into more datasets 2. Building a supervised model |

***Delivery of sprint goals***

Work on the sprint Goals problem mentioned above (**P1 & P2**) and in the next sprint bring all the materials/ideas + stuff done to see what can be develop in the final 2 weeks.

***Sprint Goals (22****nd* ***- 6****th****)***

**Annexure A**

***Problem 1:***

**Aim:** Research ML Algorithms to improve efficiency in incentives Problems

Overview: With the web app and game development team designing health games with the idea of rewarding users with “coins” & utilizing them to buy items/stuff etc.. In-Game (micro-transactions) to increase active participation from users. The task is to develop algorithms to help improve efficiency like when how much coins each user should get for certain task related to exercise done or their target goals achieved according to their training exercise plan or workout.

(Noah-B: for this part, there is calculator built that takes lists of steps walked, converts it and outputs a list of calories burnt, that is now on team’s files, in relation to this task, it can be put into the game’s programming model and automatically outputs how much calories have burned for the individual and they can receive a certain number of rewards/coins.)

**Definition of Done:** Researched on efficiency of some algorithms in distribution of gifts/coins with distribution in power of 2 coins & minimizing memory usage of the system

**Project time line:**

22nd-29th: Research algos’ & it’s effects & relations to above mentioned problem

29th-6th: Develop report for the said algorithms and how can it be utilized and implemented.

**Future project:** From this research the on-going process will be to design and develop an algorithm prototype that implements incentives problem into its system.

***Problem 2:***

**Aim:** Research Fuzziness in relation to Algorithms and Game Systems

**Overview:** Within game simulators – particularly those which rely on different levels of difficulty, the true value of variables may be difficult to assess. Fuzzy logic allows us to present a form of many-values between 0-1 which accommodate the actual true value of variables. This contrasts with Boolean logic where the truth values of the variables can only be either 0 or 1. The issue we have is how to develop algorithms that can successfully take data from users on different difficulty levels, and successfully predict or implement categorization based on outputs weighted by those difficulty levels.

**Definition of Done:** 3-page report on the effect of fuzziness in algorithms related to gaming systems (such as exercise simulators etc.)

**Project Time-line:**

22nd-25th: Research the overall concept of fuzzy logic and its relation to algorithms

26th-29th: Relate the concept of fuzzy logic in algorithms to game systems (focusing on game difficulty and incentive mechanisms)

29th-6th: Write a report detailing how fuzzy systems can be used to improve algorithm predictions from IoT and Game data.

**Future project:** From this research the on-going process will be to design and develop an algorithm prototype that implements fuzzy logic into its system.