

LES MILLS

LesMills On Demand Visual Gamification

AUT

Introduction

Les Mills International is a group fitness company - we create programs and workouts that are taught and loved in gyms around the world over. Over 6 million Les Mills workouts are done across 100 countries every week. We also enable customers to directly workout at home with our video streaming fitness product, Les Mills OnDemand (LMOD).

Project Purpose

In a post-COVID-19 world, a trend in high demand right now is the gamification of workouts. This is an R&D project focusing on the gamification of streaming workouts on LMOD. This will involve the processing and analysis of visual data from both videostreams and live body motion, and the ability to combine, model and present this data in real time to users as they perform a workout on the LMOD platform.

Objectives

The main goal of this project aims to develop a working prototype that is supported by an extensive research report outlining existing solutions and required technologies that can be implemented into the current LMOD application.

Project Goals

The Identified goals for the project are:

1. Research into existing systems and modeling practices.
2. Creation of a data model from a reference video of a given workout
3. Translation of a live feed into an equivalent/comparable data model
4. Creation of a scoring algorithm/system
5. Analysis of movement to provide meaningful contextual insights
6. Real-time comparison of live & reference models

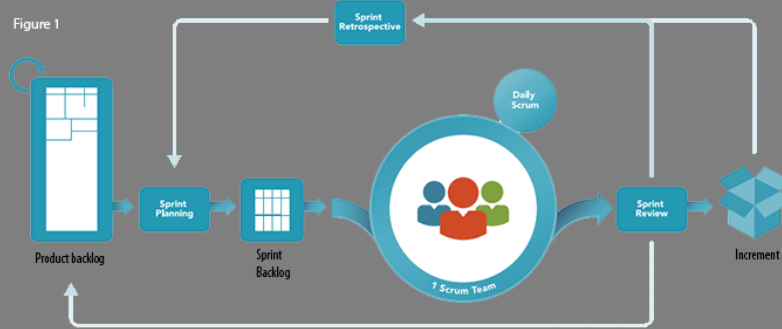
Overall goal is to have a capability proof such as a research report & prototype to determine if LesMills should proceed with a full scale implementation of the provided capability.

Method

We used Scrum methodology to plan, monitor and control our R&D project. This methodology ensures our team a high possibility to deliver a successful project by the end of semester 2.

The Scrum artifacts are as follows: Product backlog, Sprint backlog, Increment
The Scrum events are as follows: Sprint Planning, Daily scrum, sprint review, sprint retrospective, sprint

These artifacts and events encourage the team to work efficiently and closely together, as well as improve our knowledge and become more effective in the future in regards managing projects.



The Scrum procedure follows the above guide. Our team conducted a two week sprint that consisted of the iteration of scrum events and finally incrementing the final prototype at the end of sprint 2.

For our research report of our R&D, our approach started off with researching existing solutions that are currently out in the market. This way, we can test, trial and figure out how we could implement the visual gamification part to the current LMOD application.

We conclude weekly meetings to figure out which existing solutions meet the requirements that LesMills desire and thoroughly describe the implementation possibilities in the research report.

Project Artefacts



Figure 2

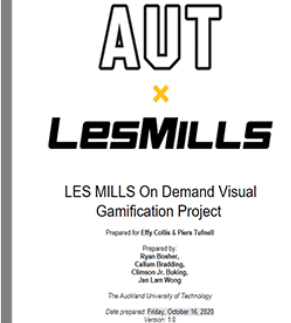


Figure 3

Our prototype above implemented real-time detection, with comparison to a referenced model and analysis between the user and the referenced model. This was all done using PoseNet which is an open source machine learning library for pose estimation.

For our research report, we recommended two solutions. One being a paid plan that includes all the requirements that LesMills desire and the other one being a open source library which is poseNet which we used to develop our prototype

Areas of Greatest Difficulty

Most of the team members did not upskill in JavaScript as the original plan was to develop the prototype for Android which affected our development progress. This was fixed by a member holding a mob programming session to get us all up to speed with each other.

Code Smell was identified too late in the development of the prototype which prevented the code from being modular. This was resolved by having to refactor most of the code in its entirety.

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References

1. What is Scrum?. (2019). Retrieved 26 October 2020, from <https://www.scrum.org/re-sources/what-is-scrum>
2. Real-time Human Pose Estimation. (2018) Retrieved 26 October 2020, from <https://medium.com/tensorflow/real-time-human-pose-estimation-in-the-browser-with-tensorflow-js-7dd0bc881cd5>