Digicoach: a digital coach for self-tracking athletes

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ABSTRACT

The Quantified Self community is growing and life logging is becoming mainstream. More and more people are quantifying themselves using tracking devices. In existing devices there is no coaching functionality, the collected data is analyzed and interpreted by the athlete himself. For runners, we developed a digital coach that is able to provide feedback in an intuitive way, without interrupting the athlete's running flow. This is done by giving vibration pulses in combination with visual led feedback. The digital coach is built into a wristband with GPS module, vibration motor and several LEDs. The next step is to give the digital coach a personality according to the DISC coaching model. This means that the digital coach can be either dominant and strict, or just relax and absent. From the data collected the digital coach should identify which style gives the best results for the athlete.

Author Keywords

Quantified Self; Coaching; Haptic feedback; Feedback loop; Self-learning systems; Running

ACM Classification Keywords

H.5.m [Information interfaces and presentation (HCI)]: Miscellaneous

INTRODUCTION

Self-tracking, lifelogging or quantified self is the phenomenon by which people measure their own behavior or activities using tracking devices [1]. This way they are trying to get insights into their own lifestyle in order to be able to improve it. The most popular category of trackers is fitness and sports related.

The iterative process of measuring, analyzing data and modifying behavior is called a feedback loop [2]. All these measurements delivers a huge amount of data, but data is not necessarily equal to insights. Many existing applications and fitness trackers only measure the performance of the athlete, but do not give any feedback. The user must interpret the data himself. Moreover, this data analysis is done only after an activity. Especially for athletes, it is

desirable that they get immediate feedback on their performance during exercise.

GOAL

The goal of this research project is to add a digital coach to the feedback loop. A coach that analyzes the generated data, interprets it and provides feedback based on this. This feedback should be given not only after, but also during exercise, so the athlete can immediately alter his behavior.

LIVE FEEDBACK

We've developed a wearable coaching module for runners. using a combination of tactile sensors and a GPS module. A rich sensing module is created that can be used for coaching runners. The device is a wristband with GPS module, vibration motor, and LEDs.

The wristband maps the running behavior of athletes using GPS. The collected data is displayed in an online dashboard . The feedback to the athlete is given in an intuitive way while running, using LEDs and vibration motors. On first use, the digital coach will do a baseline measurement to determine the basic level of the athlete. Based on this, the coach sets goals, for example to run a certain distance or reach a certain average speed. These goals will be reassessed before each run. The digital coach can give three 'commands': go faster, go slower, or " you're doing fine, keep it up." These commands are given through vibration impulses.

FUTURE WORK

The frequency in which the digital coach provides feedback and the intensity in which it is given, is currently fixed. The goal of the project is to develop a personal coach that adapts the frequency and intensity of vibration to the athlete. The next step in the research is to give personality to the digital coach. One athlete benefits from a strict coach, the other just needs one laid back. The characteristics of the digital coach will be developed based on the DiSC model, or the Five Factor Model. These models distinguish different types of coaches. This means that the digital coach can be either dominant and strict, or just relaxt and absent. From the data collected on the athlete, the coach should identify which style fits best to the athlete, in order to really develop a personal coach.

Future research will focus on investigating how a digital coach can adapt to the athlete, so that over time a personal coach will be developed. We will investigate how we can achieve matchmaking between the coach and the athlete.

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