CrowdCheer: Situational Crowdsourcing of Motivation for Runners

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1. INTRODUCTION

Many people who participate in physical activity struggle with motivation. Motivation is a need that occurs across a wide variety of fitness experience levels, from an amateur runner training for her first 5K, to a regular marathoner trying to shave a minute off her time. Motivation is also a need at different stages of the activity, from convincing herself to get out of bed and start working out to pushing herself just a little bit further to cross the finish line. Much of this motivation takes the form of self-talk [1], meaning that the athlete has to talk herself through the challenge to overcome it. While there are other ways to receive external motivation, such as coaches or personal trainers, these methods often cost hundreds and even thousands of dollars.

At races, many runners find themselves highly motivated by the cheers from the crowd of spectators, but through needfinding, I discovered that most of the time these spectators are clustered near the beginning or end of the race, concentrating their cheers to these areas, and not necessarily where the runner needs it most. In fact, marathon guides explicitly warn runners of these dead zones where cheerers are not present, and strongly advise that runners allocate their energy stores to self-motivate themselves through those exceptionally difficult segments [5]. As a result, runners design their race strategy to accommodate for this absence of cheers.

CrowdCheer attempts to utilize the crowd to alleviate this issue. First, one crowdsources cheerers from this crowd of spectators and then the system instructs the cheerers to motivate the runners when they need it most. I am studying the effects of crowdsourced & targeted motivation for runners because I want to understand how targeted motivation changes the performance of a runner so that I might utilize the existing crowd to improve the runner's performance. I take the novel approach of *situational crowdsourcing* to better leverage the crowd's ability to supply motivation for the runner.

2. BACKGROUND AND RELATED WORK

Crowdsourcing, as in utilizing the power of a crowd to accomplish a large task, is a now a well-established area of research in HCI literature. Crowdsourcing has been used to accomplish many types of difficult computational tasks, such as Soylent [3], a crowd-powered writing and editing system and Cobi [7], a system that resolves complex conference planning challenges with help from the crowd. It has even been popularized in large task markets like Amazon Mechanical Turk [9] and crowdfunding sites like Kickstarter [4].

Existing research explores crowdsourcing data observation and analysis tasks. Both eBird [10], a crowd-based bird observation network, and NASA's crowd-based crater demarcation system [6] use gamification methods to recruit and retain participants who help observe and track a large quantity of scientific observations for research. Other existing systems address the challenges of real-time crowdsourcing. Adrenaline [2], a system that uses the crowd to filter through a video to find the best single moment to turn into a photograph, requires the application of explicit recruiting methods to maintain a synchronous crowd working together, and then applies the retainer model to pay crowdworkers to stay on standby for the real-time task. A system like Adrenaline could easily be applied to the issue presented, however, a much simpler approach could utilize the existing idle crowds at events such as a marathon, where the synchronous crowd is already present, and the retention of the crowd is built into the duration of the event.

3. APPROACH AND UNIQUENESS

This approach of situational crowdsourcing is unique to the field. Crowdsourcing literature discusses similar areas, such as on-the-go crowdsourcing, where one utilizes the paths traveled by runners, bikers, and pedestrians every day. Another similar area is real-time crowdsourcing, which focuses on gathering a crowd and having them contribute to a task in real time. However, utilizing existing crowds to accomplish a task has yet to be explored. These existing crowds tend to form around specific situations with a set duration, such as sporting events, concerts, festivals, and conferences.

A major challenge with crowdsourcing in general is the need to design methods for recruiting a crowd. Beyond recruiting, even bigger challenges exist specifically for real-time crowdsourcing. As outlined by the literature, one must then retain the crowd through the completion of a task [2]. Once the crowd is retained, one then needs to address controlling the real-time crowd by balancing the time each worker spends on a task with the quality of a worker's input. This must be done to ensure that one only utilizes the worker as a resource for a short period of time without sacrificing the quality of the whole output [8]. Instead of scaffolding systems to recruit, retain, and control crowds, what if systems utilized the crowd in situations where crowds already exist? The use of situational crowdsourcing

enables rapid, reliable, and potentially free recruitment & retainment due to the intrinsic motivation of already present crowd members. Furthermore, it enables continuous, real-time crowdsourcing where the system repeatedly accesses the power of a crowd through the duration of the situation.

To evaluate this approach of situational crowdsourcing, I designed and developed CrowdCheer, an iOS application that uses the existing crowds at races to facilitate distributed cheering for runners during a race. Cheerers and runners create quick profiles before the race. On race day, the runners simply start the app at the beginning of the race and stash their phones away for the duration of their runs. The cheerers enter the cheering mode and wait along the sidelines of the race route (see Figure 1). When a random runner using CrowdCheer begins to approach them, they're notified in time to cheer the runner. Upon receiving the notification, the cheerer is shown basic information to identify the runner, including her bib number, name, and a picture. With this information, the cheerer is able to supply a personal cheer, such as "Keep going, Jane!"

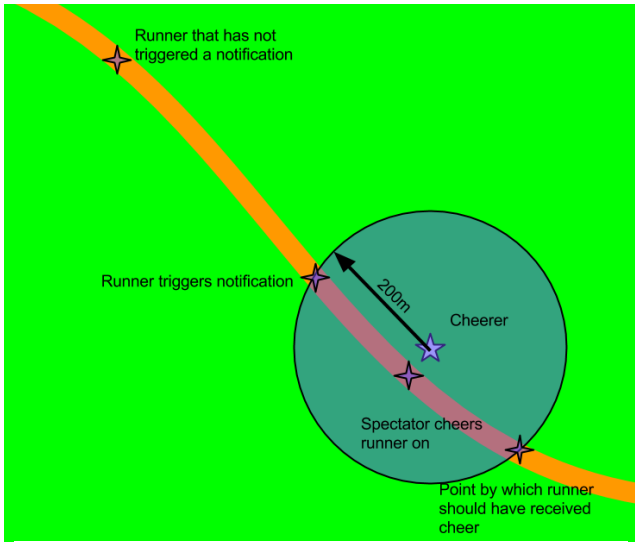

Figure 1. CrowdCheer Notification Trigger

To understand how crowdsourced and targeted motivation might change the performance of a runner, I have designed a study that uses situational crowdsourcing to leverage the crowd's ability to supply motivation for the runner while measuring the effects of the targeted motivation on the runner's race performance. I hypothesize that the pace of the runner after receiving a cheer will improve compared to the pace prior to receiving a cheer. I also hypothesize that the overall race time of runners who received cheers will be faster than their target race times relative to runners who did not receive cheers.

The goal of the study is to crowdsource approximately 30 runners and 30 cheerers on the day of the race. 30 runners would be split into two groups of 15: one group would receive cheers and one group would not. I would measure the performance of the two runner groups based on the following:

Δ pace = average pace – target pace

Δ race time = final race time – target race time

A successful study would demonstrate that the crowdsourced group of cheerers would be able to supply targeted motivation that would potentially improve the performance of runners who received cheers. Thus, the data would show a negative change in pace, meaning that the runner's pace was faster than expected, and would show a negative change in race time, which would demonstrate that the runner ran the race quicker than expected.

4. RESULTS AND CONTRIBUTIONS

To date, I have only tested the CrowdCheer system in a pilot study, and plan to test CrowdCheer at a larger race in the coming months. In my pilot study, I tested at the Chicago Get Lucky Half Marathon (21K) Race on March 14, 2015. With the race starting at 9:00 AM and runners queued up at the start by 8:30 AM, recruiting runners and recruiting cheerers from the existing crowds lasted approximately one hour, starting at 7:30 AM. In my preliminary interviews with cheerers and runners, the majority of interviewees expressed interest and even excitement about crowdsourcing motivation throughout the race. I was able to recruit 20 participants for the study, broken down into 7 cheerers and 13 runners.

In the post survey, the positive responses were reiterated. Of the 16 people who responded to the survey, 12 reported they would definitely use the application again, 2 reported that they might use it again. In their feedback, many users reported that they wanted to see an even larger user base on race day. "I would improve it by advertising more, I think if a lot more people know about it, then it will def[initely] be more fun" said one cheerer. Due to some errors in the app's ability to notify the cheerer at the appropriate times, I were unable to record usable data to investigate any changes in performance for runners, but many runners self reported the positive effect of hearing cheers. One runner who reported receiving 7-10 cheers from strangers said, "My speed and mood always increase when people cheer."

Before my next round of testing, I plan to resolve any bugs in the app that were exposed to ensure proper data collection to back my findings as seen through the post survey feedback of the runners and cheerers. By seeing this data, I will have a better understanding of the positive effects of using situational crowdsourcing to gather a group of cheerers on race day, and having these distributed cheerers perform the real-time task of motivating runners, and how these effects might be powerful enough to actually change the performance of a runner throughout the duration of a race.

5. REFERENCES

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