

JoggAR: a mixed-modality AR approach for technology-augmented jogging

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1 Introduction

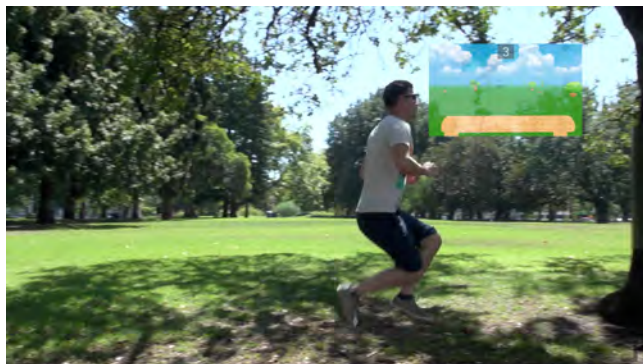


Figure 1: Screenshot of the JoggAR game.

JoggAR demonstrates a novel combination of wearable visual, audio and sensing technology to realize a game-like persistent augmented reality (AR) environment to enhance jogging and other exertion experiences that involves changing attention intensities in the course of the activities. In particular we developed a method to perform an *audio-first exploration of 3D virtual spaces* so as to achieve our experiential goal of supporting exertion-focused activities.

Jogging is one of the most common form of exercise. Recent wearable technology has popularized the notion of technology-augmented jogging (e.g., using smartwatches or mobile jogging apps) but are mostly concerned with performance aspects (e.g., tracking distance and heart rate). Our solution however, presents an experience-first approach to technology-augmented jogging, which primarily include an increased enjoyment and hence adherence to the exercise. To achieve this, we developed a novel mixed-modality approach to AR that specifically targets exertion-focused activities like jogging.

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2 JoggAR Design

In essence, JoggAR consists of a persistent virtual world (VW) that updates according to the jogger’s real world (RW) actions. The VW is an “infinite runner” game whereby the jogger takes on the role of a runner in the game as well, but with a fantasy type environment and with virtual challenges presented to him/her.

Deviating from the usual AR notion of overlaying computer-generated graphics onto the RW, we take an alternative approach of AR by using a combination of modalities. In particular, our system appropriately switches between visual and audio modes using sensor technology to enable a form of *on-demand AR* suitable for exertion-based activities, in order to allow the jogger to focus on the RW actions as a priority. We coin this approach an *audio-first exploration of 3D virtual spaces*. This approach is useful for many types of VW to RW augmentations where attention on the RW actions are of top priority (e.g., cycling and swimming).

JoggAR is hence conceived from a formalized set of design guidelines grounded in prior HCI research [Mueller et al. 2010; Mueller and Muirhead 2015]. Jogging is an activity that changes our cognitive abilities in the RW, e.g., when fatigue sets in during the later stages of a run, we often transfer more cognitive attention to the core jogging action (i.e., a series of strides), and will be much less able to focus on augmented information or activities.

In conclusion, we presented JoggAR, a *technology that improves our daily lives* by offering novel exertion experiences, facilitating more people to profit from the many benefits of exercise.

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