Towards personalized gamification to promote Physical Activity

Obesity among children and adolescents has become a significant public health problem in the USA. This has motivated researchers to develop physically-interactive gamified applications (e.g., Exergames) that implements game elements to promote physical activity. These applications aim to exploit the elements of video games that make them engaging and motivating for children and adolescents. However, researcher has shown that a gamified application that motives an individual might not have the same effect on another individual. Moreover, studies have indicated that the difficulty level of a gamified task can have a direct impact on individuals' performance and motivation. Thus, researchers advise that more customization and personalization of gamified applications is needed. In light of this, a machine learning method to predict individuals' performance on a physical task prior to the start of a task is presented. The method automatically captures individuals' facial expression and physiological signals while interacting with a gamified application. A case study involving 15 participants is presented. The results indicate that the model yielded an accuracy of 76.48%. The proposed method could potentially be used to adapt the game elements and task difficulty of gamified applications; hence, improving the motivation of children and adolescents to perform physical activities.