Zirkus Empathico 2.0

A serious mobile game for empathy enhancement in children with Autism

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Abstract: The aim of the mobile app 'Zirkus Empathico 2.0' is to improve emotional empathy and social competencies in Pre-school children with autism spectrum disorder (ASD). The holistic idea of grounding is based on genuine results of empathy research. An examination of the app exposed its good usability and comprehensibility. The application 'Zirkus Empathico 2.0' is scheduled to be thoroughly investigated in a longitudinal clinical dissect in children aged five to ten.

Keywords: Serious games, Autism spectrum disorder, Social behavior in Autism, Emotional intelligence

1   Introduction and Novelty

Empathy is the ability to recognize and understand the feelings of other people [Dz08]. Several studies show that individuals suffering from autism have cognitive-reduced empathy, that's why they have difficulty in understanding the emotions or gestures of the other people [Bo13]. Serious games (SG) approach to enhancing empathy through recognizing and producing precise facial emotions has proven to be very useful over the past two decades [Ha10]. Games that have a specific learning goal apart of entertainment are called SG. This article presents a SG that has been developed to enhance empathy in children with autism. Both the usability and design of SG are equally important and there is a need for a better understanding between developmental psychology and computer science. In 'Zirkus Empathico 2.0', we have considered these issues and added some useful features in comparison to its previous version 'Zirkus Empathico'. A user profile is created to keep track of user performances, and the on-screen time. The game adapts to the individual user's playing performance. An online and offline multiplayer module has been added to boost the social interaction and collaborative skills of the individuals. This SG is the first multi-player game for children with ASD of its sort.

2   Game Concept and Architecture

The mobile application 'Zirkus Empathico 2.0' consists of four distinct modules based on social cognition. Tasks are laid out to provoke individuals to determine their feelings or

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emotions (module 1). The identification of other people's emotions from videotaped facial expressions (module 2). An individual's emotions in response to the other person's emotions must be defined for building up emotional empathy (module 3). To improve collaborative skills, there is a multiplayer mode where children play with their peers online or offline (module 4). Fig 1 explains the game concept. Game is designed in Unity 3D with modular approach. Cordova plugins were used for internal app logics. For the structure of application Model view controller (MVC) paradigm was used. There were total six view controller which were managed by tool grunt.
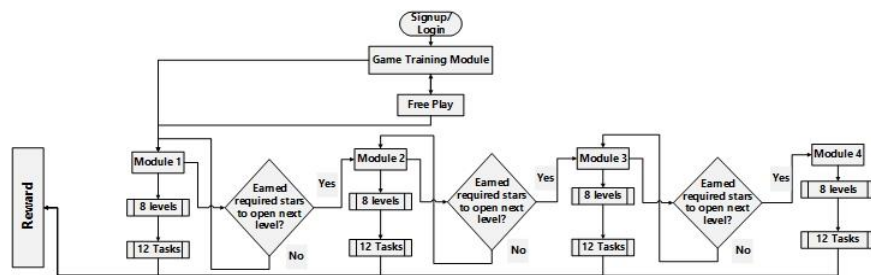
Fig. 1: Game concept and training module

The mobile application Zirkus Empathico 2.0 is created with multi-disciplinary research on developmental psychology and software engineering [BCH11]. This SG is the first multi-player game for children with ASD of its sort. After the scheduled clinical execution, we can investigate its viability in more detail.

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