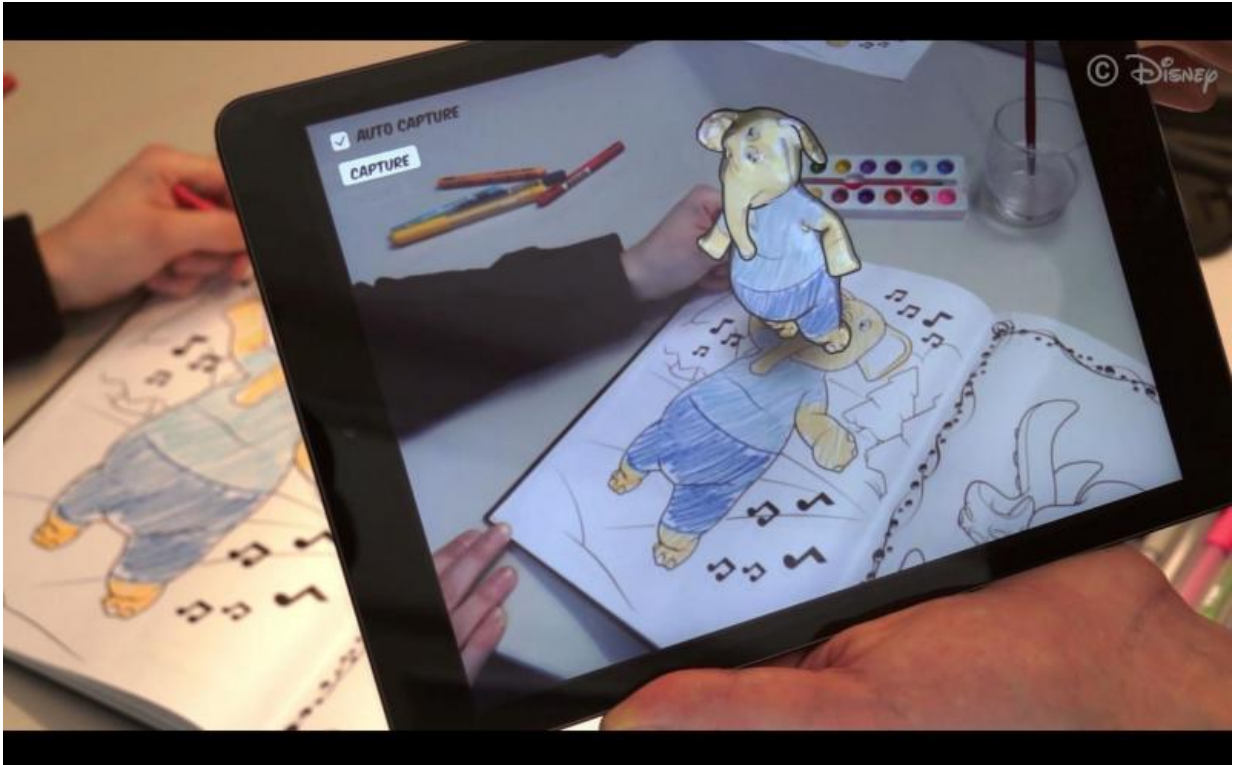# Game apps for creative kids

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Researchers at Disney Research Zurich and ETH Zurich bring characters from coloring books to life. Credit: ETH Zurich

Augmented creativity can encourage children towards a new-found sense of creativity, cooperation and interaction with their environment. ETH Zurich's Game Technology Center will present its latest apps in the field at the CeBIT computer expo.

With games on their smartphones and YouTube movies on their tablets, children learn about the possibilities of mobile devices early on. In this environment, traditional toys, colouring books and crayons may seem out dated. That's why the nursery is opening up to the digital world, too, and finding a new lease of life through apps.

ETH Zurich's Game Technology Center will present examples of this kind of augmented reality at CeBIT, the world's largest computer expo, which runs from March 14-18 in Hanover.

Real-time animation from children's drawings

The researchers at the Game Technology Center and their colleagues at Disney Research Zurich have been working on a number of new apps, and have even coined a new term to describe them: Augmented creativity. This means a fusion of animated, virtual elements with a real-life environment that encourages creativity and imagination in children. "Our apps make use of children's enthusiasm for digital devices, but at the same time encourage them to interact more deeply with their surroundings," says Bob Sumner, head of the Game Technology Center. In the case of the colouring books, this works as follows: Children use crayons or markers to color in line art printed in a book; say, an octopus, bear or elephant. When the camera of a tablet or smartphone with an augmented creativity app is pointed at the drawing, a moving avatar of the figure appears on the screen.

The app runs on a sophisticated algorithm that matches the colour of the animated figure on the screen to the real-life drawing several times a second. The drawing process in the colouring book is transmitted in real-time to the animation. In addition, the occluded regions on the reverse side of the figure, which cannot be seen on paper, are textured as realistically as possible in the virtual counterpart. The drawing has transformed into a little cartoon; "a magical experience for kids", says

Sumner. Although there are no representative user studies yet, the first feedback from friends and their children has been resoundingly positive, explains the researcher.

Collaborative games in 3D

The interactive colouring book is one of a total of six augmented creativity applications that Sumner and his colleagues presented recently in a scientific publication. One takes the shape of a collaborative game, in which up to four players, each with a tablet, sit around a tripod featuring a cube-shaped augmented reality marker. When the tablets are aimed at the marker, aliens, bridges and doors appear on the screen. The players have to physically move around the room and position themselves in front of the virtual doors in order to collect points and defeat the aliens. Team spirit and the ability to coordinate with other players are essential; group formation processes and social skills are strengthened through play.

In principle, augmented creativity can be applied to any kind of space, whether a book, a room or an entire city. In their paper, the researchers also present an app that gamefies public spaces. The basic principle is similar to that of the colouring book: when a pre-defined building is filmed with a smartphone or tablet, virtual objects such as illuminated panels or number puzzles appear on its facade, via the device's screen. Players collect points by solving these tasks, turning a walk around town into a game, and the player into its hero.

Augmented reality for all

For now, the apps created by Sumner's team are just prototypes, in order to experience augmented creativity and to test out its potential applications. They are not available in app stores and the team is not

focusing on their commercialisation. Nevertheless, Sumner is convinced the concept has great potential—not just for [children](#), but for adults too. Indeed, virtual reality (VR) and augmented reality could soon become part of our everyday lives: The first commercial glasses capable of blending virtual content with real-life surroundings should be available soon. Microsoft will bring its Hololens on to the market this year, and Magic Leap, a Google-financed start-up, is aiming to do the same.

Things are also happening in Switzerland: VR start-up Mindmap recently acquired $100 million in venture capital, and Artanim presented its VR technology at this year's Sundance festival in Utah. Whether this integration of the virtual into our everyday lives catches on depends not just on the hardware, but also on whether [augmented reality](#) apps capture the public's imagination. For those looking for an early glimpse, the Game Technology Center's stand at this year's CeBIT is open to all.

Provided by ETH Zurich

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