

Do-it-yourself Virtual Reality Experiences on Networked Mobile Devices

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Figure 1: customizable controllers



Figure 2: mobile editor



Figure 3: real-time networking



Figure 4: user test with toddlers

Abstract

Realiteer is an innovative Augmented Reality & Virtual Reality (AR/VR) software content creator. Our lead product, Canvrs, helps artists and software developers create VR/AR-optimal 3D assets and animated special effects by providing them with a VR art studio designed for making VR/AR assets from scratch.

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Realiteer leverages its proprietary patent-pending technology and creative expertise to acquire and retain users for Canvrs. Its innovative technologies have already been featured in several news outlets, including CCTV, Gizmodo, Tech Times and Stuff Magazine.

In the first 9 months of its operation, Realiteer has filed 3 patent applications and launched two proof-of-concept apps that were featured on Google Cardboard and totaled more than 300k in Android and iOS downloads.

Keywords: virtual reality, augmented reality, ar, vr, realtime, diy, mobile phone, network, multiplayer

Concepts: • **Human-centered computing**
~ **Human-computer interaction; Interaction design;**
Collaborative and social computing

1 Technologies

2.1 VR/AR input

Mobile VR/AR headsets lacks input solutions today. We have developed RealControl that uses a smartphone's camera to track the position of our unique image pattern, which allows us to then predict the movement and actions of the user's hand and arm. RealControl is extremely simple to make, anyone with a printer can DIY in a matter of minutes.

To help users navigate in the VR world, we utilize phone's acceleration data and our proprietary noise reduction algorithm to detect a user's steps when they move, which is then translated as movements of the user's avatar in VR.

2.2 VR/AR Headset

Our VR headset is an easily foldable version of the Cardboard, and even easier to assemble.

2.3 Content generation on mobile devices

Anyone can easily generate VR content using our creative suite in mobile VR. Our tools are easy to use and intuitive to learn.

In order to work on mobile devices where screen space is extremely limited, we have developed a scheme to simplify VR scenes. Based on user studies during the process of making 4 top rating VR apps, the scheme includes:

- (1) an UI/UX principle for interacting in VR
- (2) a set of predefined methods to describe and control VR scenes, and
- (3) templates for common VR scenarios.

With our editor app, users can simply choose a template, drag-n-drop text and media, and then arrange scene flow to finish their VR experience.

2.4 Networking in real-time

Once the VR content is published, audiences can participate together at the same time in our real-time networking environment. No matter where they are, the users are enjoying the experience with friends in the same VR environment at the same time.

In order to network smoothly on mobile devices, we have optimized the scenes and assets to minimize data usage through average internet connection.

3 User Test Results

We have conducted several user tests in events where the mass public tried out our technology, such as Maker Faire, Siggraph, Science Days, meetups and etc. The feedbacks are consistently positive and results are promising. It is encouraging to reaffirm our belief that people are capable of creating and enjoying VR with little training: even preschoolers found our technology

intuitive and easy to use.

Based on these results, we are developing lines of educational products. VR now can enter the market in a fun and social responsible way.

4 Conclusion

Today, creating VR experience still requires professional workstations, graphic knowledge and programming skills, which makes the process inaccessible to creative minds without those equipments/hardware/knowledge. We see the value of having an authoring platform which enables everyone to easily create and share VR experiences.

There will be 6.1 billion smartphone around the world by 2020, we fully believe the potential of mobile VR reaching billions of users in the not too distant future. Anyone of these users can easily exercise his or her creative mind on our platform with close to zero hurdles.

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