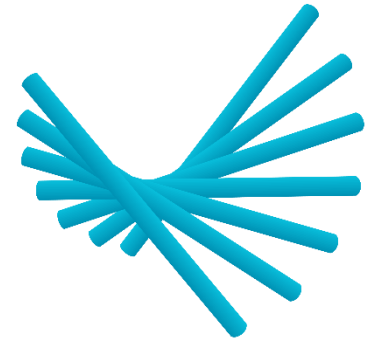# Experience Report on Immersive Augmented Reality

Leo Sakari – ARea15 workshop 11.06.2015

Turun yliopisto
University of Turku

Background

- IARP was a student project that was conducted last winter. The goal of the project was to build a platform that allowed researching and demonstrating **immersive** augmented reality

- Several trials with different hardware solutions were created and application prototypes were developed

- Experiences were gathered from the visitors that played a demonstrative immersive augmented reality game in the ICT Showroom 2015, an annual showcase event for IT student projects

Immersion in Augmented Reality

- Our definition of immersive augmented reality:

> *Immersive augmented reality is a subset of augmented reality where the user*
> - *Can see augmented content in his/her whole field of view*
> - *Does not experience disruptive artifacts such as latency or low frame rate*
> - *Observes the world using a hands-free display device such as a head-mounted display*

- On the software side this is already achievable…
- …but suitable hardware is not available

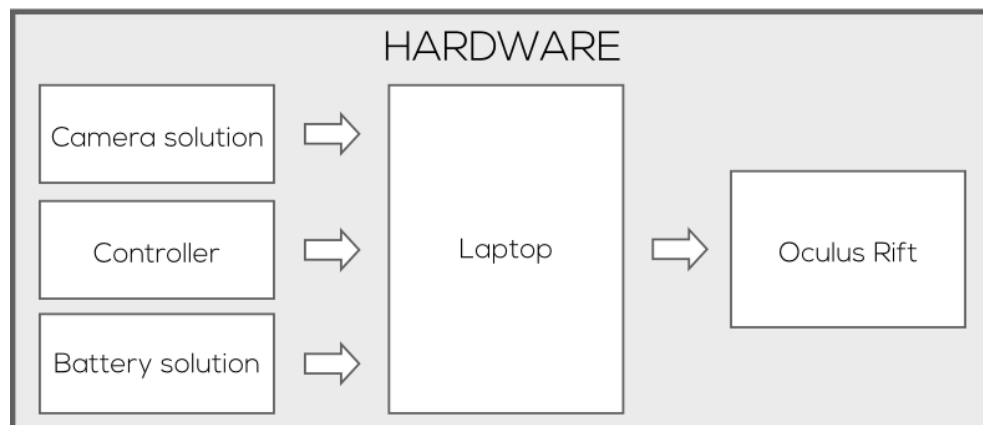# Existing and Upcoming Solutions
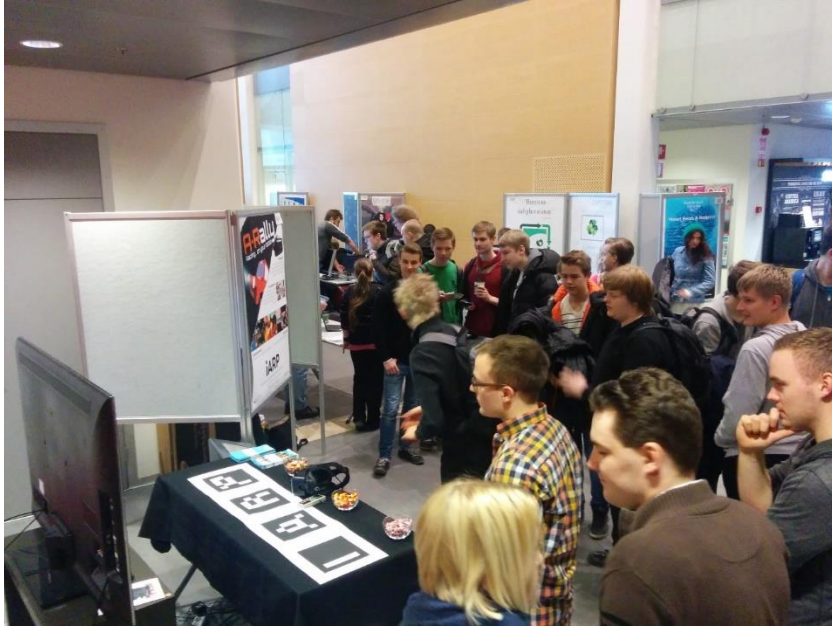

Epson BT-200

Microsoft HoloLens

Vuzix M2000-AR

DAQRI Smart Helmet

Technical Implementation

	Webcam rig	Ovrvision
Resolution (per eye)	1080x1920	640x480
Frame rate (FPS)	30 FPS	60 FPS
Latency	~300 ms	50 ms
FOV (horizontal)	43,30°	90°
FOV (vertical)	70,42°	75°
Weight	437 g	50 g
Interface	2*USB 2.0	USB 2.0

SOFTWARE

- Unity game engine
- ArUco tracking

HARDWARE

- Camera solution → Laptop → Oculus Rift
- Controller →
- Battery solution →

ICT Showroom 2015

Conclusions

- Immersive augmented reality is not yet quite ready for commercial applications

- A release of smartglasses with a suitable field of view would most likely be a major breaking point

- One could argue that immersive augmented reality is the true form of augmented reality