



## Charity Consortium

The CHARITY consortium includes 15 partners from 10 countries, including 5 partners from the industry, 2 academic and/or research organization partners and 8 SMEs, which together bring to the project the full range of expertise to realize its ambitious objectives.



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ORama VR



PLEXUS  
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# CHARITY

Cloud for Holography and  
Augmented Reality

## The Next Step Towards Immersive Communication

Creating new business opportunities  
for the European Industry

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Horizon 2020





Horizon 2020 project CHARITY develops an open-source framework and tools for enabling next-gen applications allowing immersive communication based on the intelligent use of network resources.

The project will prove the feasibility of its solutions via three use cases:

### UC1 Real-time Holographic applications



Holographic Concert



Holographic Meeting



Holographic Assistant

### UC2 Immersive virtual training



VR Medical Training



VR School

### UC3 Mixed Reality interactive application



Manned-unmanned Operations Trainer



Collaborative Gaming

CHARITY aims at bridging the gap between the capabilities of 5G networks and the huge resource demands of advanced holographic and Virtual Reality applications.

Tackling this challenge means to position Europe at the cutting edge of immersive communication solutions and will open up new business opportunities for the European industry.



Horizon 2020

### Use Case 1

## Real-time Holographic applications

Holographic concerts with remote musicians playing together in real-time pose huge technical challenges. CHARITY will tackle this challenge with intelligent network and end-user schemes for encoding/transcoding, compression, caching and synchronization. A holographic meeting use case is based on the same technical principle.

CHARITY also targets a holographic assistant use case, adopting the physical principles "diffraction and interference of light" to enable real 3D holography, based on very sophisticated custom optical components and algorithms. This lays the foundation for showing a butler-like avatar in 3D space on a holographic 3D display with true depth and true eye focus - for your eyes it is like natural viewing.

### Use Case 2

## Immersive virtual training

CHARITY will explore a VR-based schooling use case. It consists of multiple students connected to a virtual classroom, in which the teacher can provide virtual objects for the students to interact with, as for example, a virtual 3D model of a DNA helix in a biology class. The challenge is to simulate the interaction in the virtual environment close to real life to provide a full immersion experience.

Furthermore, a Virtual Reality (VR) medical training use case will provide experiential simulation for medical training and assessment with cutting edge VR. The realistic surgical training modules will allow a large number of concurrent medical personnel-users to collaborate within a virtual environment, interacting with 3D soft bodies of tissues, muscles, and more.

### Use Case 3

## Real-time Mixed Reality interactive application

CHARITY will explore two mixed reality (MR) interactive applications, which combine Augmented Reality (AR) and VR.

The first is a highly immersive multiplayer AR game. In order to provide players with sufficient immersion, CHARITY will develop a dedicated multiplayer engine which will be able to synchronise all dynamic game objects along with the user states.

The second is an operations trainer for helicopter flights in a search-and-rescue scenario with multiple collaborating manned and unmanned vehicles. Participants can virtually collaborate in a coordinated search within a largely synthetic environment including a free viewpoint and real equipment. This application will contribute significant advantages for future training and simulation systems by enabling the merging of synthetic and real imagery into the video stream as well as collaboration across multiple locations.