Enhancing Artistic Immersive Video Experiences with Novel Adaptive Rich Media Delivery Solutions

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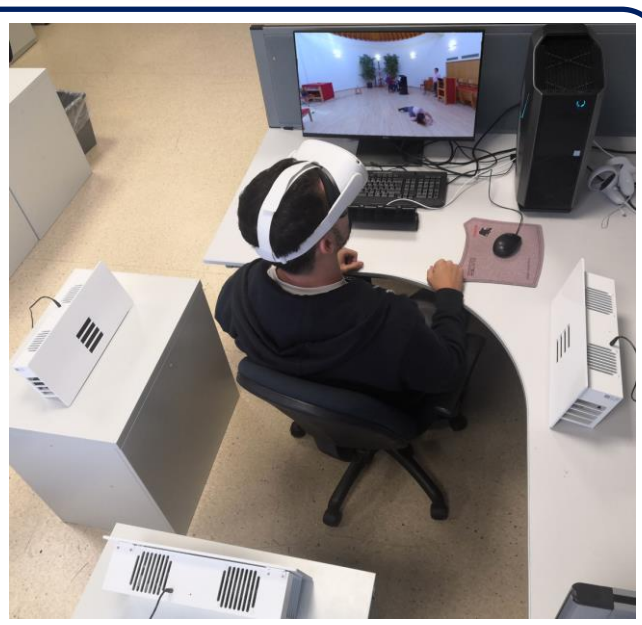
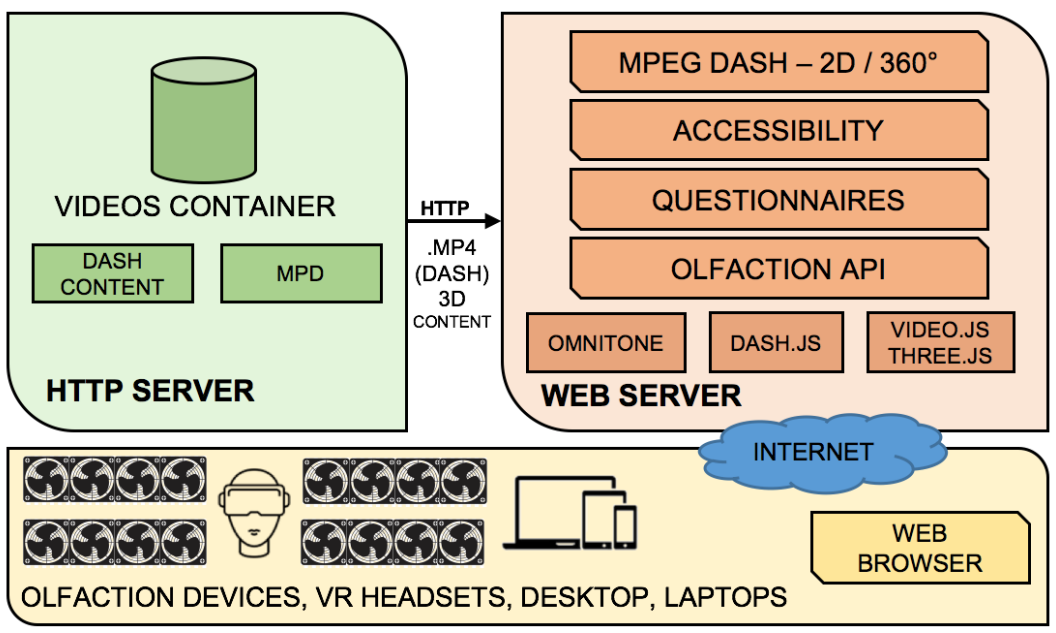
Introduction

- Scents are connected to the brain memory function and can be used in various settings, including for marketing, product design and entertainment.
- Olfactory stimuli, combined with visual and audio cues, enable the creation of more realistic experiences in immersive environments
- Streaming such rich media content via limited network capacity requires content adaptation (adjusting quality according to network capabilities)
- Adaptive solutions are designed and tested as part of the **EU H2020 project TRACTION**, which disseminates opera co-creation through novel mediums.



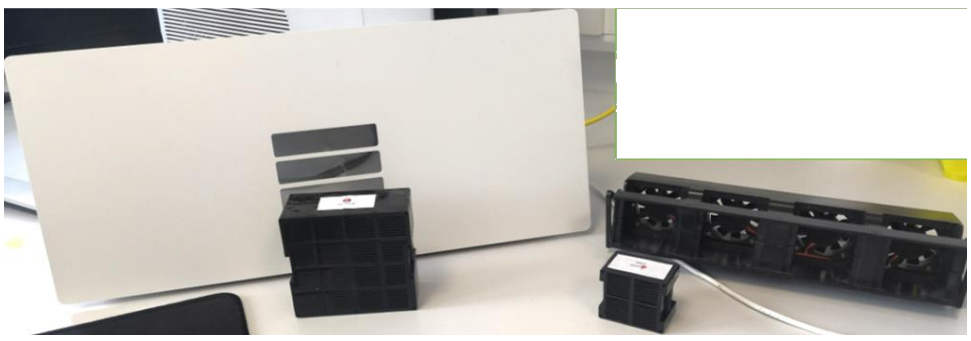
System Architecture

- The web-based rich media player supports dragging the point of view with a mouse, touch screens or head movements when using virtual reality headsets.
- The player architecture requires a webserver (e.g. Tomcat), which hosts the web application, libraries, and communicates with olfaction devices, and a HTTP server (e.g. Apache), for hosting the content.
- The player implements the Omnitone library for ambisonic audio, dash.js for video reproduction, and Three.js for 360° content rendering. VR headsets are supported via browser with the videojs-xr library.



Omnidirectional Olfaction

- Multiple olfaction devices are placed around a user, releasing scents in the same direction with the triggering scene in the 360º video.
- User test results show how **73%** of the participants identified omnidirectional scents allowed them to look at the triggering directions in the videos and **93%** of them related the scents and video content



360º Video Adaptation

- A novel adaptation algorithm enables 360° video content streaming in loaded networking conditions
- The proposed adaptation algorithm considers network variations to adjust transmission and minimize video stalls.

- It improves user perceived quality in comparison with other state-of-the-art adaptive schemes

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Traction Opera co-creation for a social transformation