ChEESE

D6.4 Second video

Version 2.0

Document Information

Contract Number	823844
Project Website	https://cheese-coe.eu/
Contractual Deadline	31/07/2021 (M33)
Dissemination Level	Public
Nature	PU
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The ChEESE project has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement No 823844

Change Log

Version	Description of Change
V1.0	Initial draft for internal review
V2.0	Permanent link added; Reviewer's comments were addressed

Index

1. Introduction

This deliverable presents the main dissemination video about the ChEESE project and explains in detail the process of creating it. This first part describes the motivation and main target audience. The second part explains the production phase, including the process of making high-end visualizations of simulation results, plus the editing, composition and sound design. The last part provides the technical details of the video, software and tools used in the production, and the permanent links to watch and download the movie.

The primary intended audience is civil protection stakeholders. However, the goal is that a wider audience can enjoy it as well. Thus, the contents are arranged under a multi-layer approach, where the audio narration is light in technical details, and more information is available in the form of legends and annotations on-screen. Therefore, the main messages can be effectively communicated to a general audience, while a more specialized public can also benefit from technical details about the project.

2. Production process

2.1. Pre-production

The script was written by the Barcelona Supercomputing Center (BSC) Visualization team in collaboration with Arnau Folch, Rose Gregorio, and Josep de la Puente, all from the BSC. The storyline focuses on the Pilot Demonstrators. Once the script was accepted by the authors, the different research groups in the consortium were asked to send simulation results and images of their research to be used in the video.

2.2 Data conversion

We used the same commercial software of feature film productions to produce high-end visualizations of simulation results. To produce the visualizations, we used a suite of proprietary tools and scripts to convert the various datasets to standard formats that could be loaded in the commercial software packages.

The original datasets were mainly volumetric data, which was converted to voxels in OpenVDB format. Other datasets were available as 2D geometries and .CSV tables.

2.3 Visualization tests

The first approach was to load the datasets in the same scientific visualization tools used by the researchers to identify the most interesting and informative features. A key part of this process was the communication with the researchers that produced the data. Then, the converted datasets were loaded into the commercial 3D software Houdini to produce shading, texturing, lighting, and render tests until the desired aesthetics for each video was achieved.

2.4 Video editing and validation

Once the overall aesthetics of the video was defined, the complete sequences were rendered in Arnold Render, passed through a color correction process, and were finally edited. A first draft was sent to Andreas Fichtner for internal review on July the 16th, his feedback was fully incorporated to the final version: We improved the sound quality, made a minor change in the big data section of the script, and added legends, annotations and color scales to all the visualization shots. This was precisely the last step, to enrich the video with relevant information, titles, details about the simulation runs, legends, and color scales. This last part was done in collaboration with some of the researchers that produced the data, as well as the project's coordinator.

3. Contents of the video

The video follows a classical three-act structure with: a) introduction, the presentation of the problem; b) confrontation, how the problem is addressed, and c) resolution, conclusions and future challenges.

The introduction poses first, the threat of geo hazards, and second, how scientists monitor and study them. This part features live action-footage and screenshots of scientific visualization software, including a video of the Cadiz tsunami simulation in a VR environment by HLRS, images of seismic monitoring by INGV, and footage from the Marenostrum supercomputer. The other movies are from different authors under a Creative Commons license and are attributed in the end credits of our movie.

In contrast, the second and third parts are exclusively Computer Generated Imagery (CGI). These parts show high-end renders of simulation results, or animated infographics where no datasets were available to fit the narration. The simulations showcased in the video are: Samos-Izmir earthquake (BSC), Vesuvius eruption (INGV), Cadiz tsunami (UMA), Husavik earthquake (TUM), Maule tsunami (INGV), automated seismic source detection (IPGP), high resolution seismic tomography (CNRS), Caulle volcano eruption (BSC), and the earth's magnetic fields (IPGP).

4. Technical details and permanent link

Most of the simulation data was converted using VTK format, plus proprietary tools and scripts to generate VDB volumetric datasets. Other simulations were converted to csv tables using Paraview. All the visualizations were animated in SideFX Houdini, and rendered in SolidAngle Arnold. The annotations, legends and scales were added in Adobe AfterEffects and the video was edited in Adobe Premiere. The voiceover was commissioned to a professional voice actress, and the music and sound to an external collaborator. The final movie is available in different formats. A master .mov file in Apple ProRes422 codec, and high-resolution .mp4 movie files suitable for Youtube and Vimeo in H264 codec. The music and voice tracks are available separately, so different languages can be recorded if necessary.

The movie is available permanently at the BSC's YouTube channel:
https://youtu.be/TAue0hEGD-k