4th V4Design Newsletter (December 2018)

Visual and textual content re-purposing FOR(4) architecture, Design and virtual reality games

It has been quite an interesting trimester for the V4Design consortium, filled with project presentations, project meetings, events and a great participation in ICT 2018 in Vienna.

As the holiday season is upon us, we find ourselves reflecting on the past year and those who have helped to shape V4Design. We hope that 2018 has been just as memorable for you, your colleagues and your loved ones as it was for us. We look forward to sharing with you all our work within the V4Design context in the years to come.

During the last months, the project has advanced its research and development activities towards the implementation of the V4Design platform. The V4Design system architecture has been finalised and depicts the components that are going to be implemented by the technical partners. In addition, the empirical study of the materials compiled in the initial part of the V4Design project has been completed. The study outlines the types of textual material that are to be analysed in the framework of the different use cases, along with quantitative and qualitative assessments of the contents for the purposes of the linguistic analysis and summarization modules.

Last but not least, user requirements have also been finalized as well as and the semantic models for mapping the V4Design-pertinent conceptualisations on ontology-related constructs have been documented.

Consortium partners also participated in a number of high-profile conferences and fairs disseminating the V4Design project and introducing its concept and its main objectives to the public (such as the MediaEval2018, the MADVR 2018, and of course the ICT 2018).

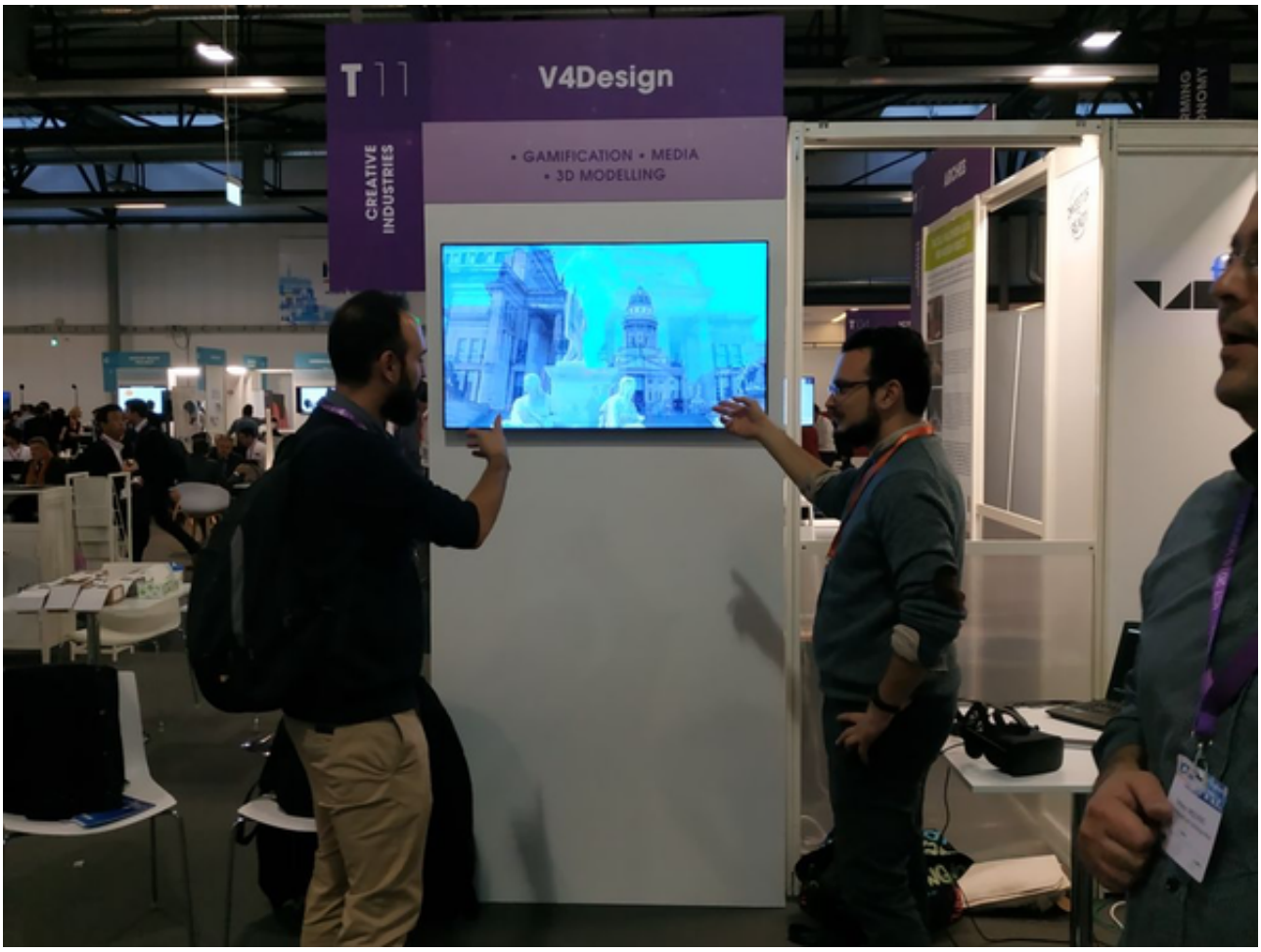
Last but not least, the Consortium partners were gathered in Ghent on December having a very productive technical and plenary meeting, preparing presentations and demos in the light of the upcoming review planned to take place in Bonn on January.

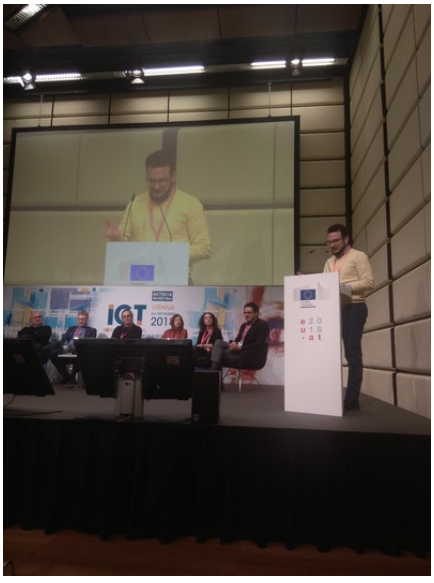
Continue reading to discover more about our work in aesthetics and localization, our participation in ICT2018 and more updates regarding the project progress!

Participation in the ICT 2018

V4Design successfully participated in the EU ICT Exhibition 2018 in Vienna, Austria, from Dec 6 – 8, 2018. Experienced V4Design developers and system engineers guided visitors through the project's Virtual Reality (VR) immersive environment of V4Design, which revives the past, the present and an artistic surprise of Gendarmenmarkt square, in Berlin as the figure depicts.

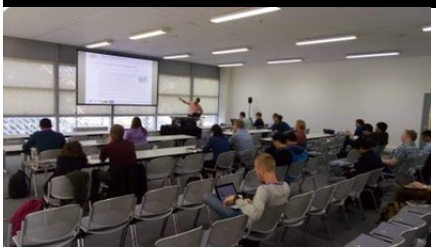
3D-reconstruction technologies have been deployed in thousands archived and crawled images in order to build a VR environment, which depicts the square as it is today and as it appeared to be in the beginning of the century. Texture proposals have also been integrated in the demo so as to enable style transfer in the reconstructed architectural structures and 3D-models. Further functionalities for video game designers have also been incorporated in the demo so that the end-users can add, move and rescale 3D-models in this immersive environment while visiting and the VR square and playing with this demo.





Several demos were presented in an attractive and interactive manner through appropriately designed booth, showcasing the project's potential for allowing architects, designers and video game creators to re-use heterogeneous archives of already available and retrieved digital content and re-purpose it by making the wealth of 3D, VR, aesthetic and textual information easily accessible and providing resources and tools to design and model outdoors and indoors environments of architecture and VR video game projects. Wide publicity of the project as well as valuable networking with other ICT stakeholders had occurred. Kostantinos Avgerinakis by CERTH, also presented a short work progress in a plenary session organized at ICT event, titled *"Art, the human touch of technology"*, which was coordinated by Ralph Dum, Senior Expert, European Commission, DG Connect and Head officer of STARTS program.

Organization of MADVR 2018



V4Design also successfully organized MADVR 2018, the 1st International Workshop on Multimedia analysis for Architecture, Design and Virtual Reality games, in parallel with the International Symposium on Mixed and Augmented Reality (ISMAR) on October 16th, 2018, in Munich, Germany.

Read more on our website:
https://v4design.eu/2018/10/23/v4design-successfully-organized-madvr-2018/

Going deeper in V4Design technologies: Aesthetics Extraction and Localization

Regarding our research progress, in this issue of the V4Design newsletter we would like to present you our work in the context of aesthetics extraction and localization.

Artwork artefacts, such as paintings, have specific characteristics that can indicate their style, genre or elsewise the school of art that they belong and the artist who created them. Style is a term which refers to several aspects of art, such as the techniques used to create a painting, the philosophy behind the painting, or the form of expression employed by the creator. A school of art is a group of creators who have been influenced from the same teachers or they share a common style, theme or ideology. Distinguishing a painting's school of art and/or creator is a very challenging problem for a human non-expert, so annotating these data is a very laborious and challenging task. V4Design project leverages its consortium partners' archives in order to get ground-truth data and trains machine learning algorithms with a wealth of paintings examples. This produces a robust and accurate aesthetics recognition module that is able to understand different elements that specify each style, such as colours, shapes and edges, and identify them in unknown painting image.

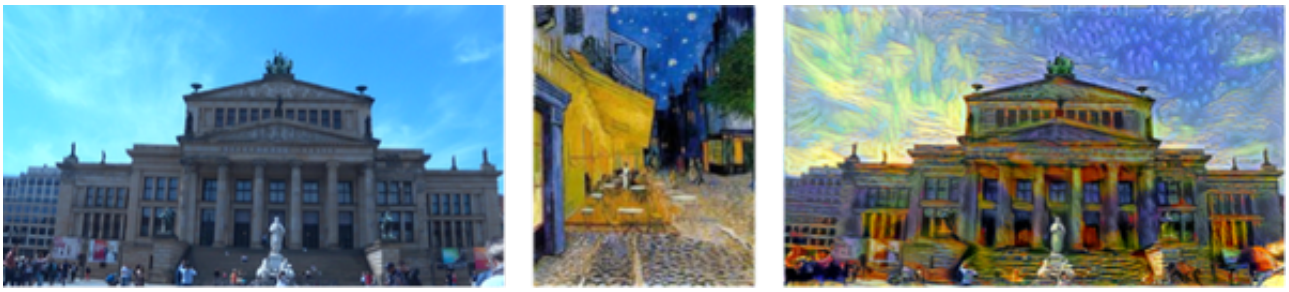


Figure 1:Transferring in an image of Gendarmenmarkt the style of the famous painting "Café Terrace at Night" of Vincent Van Gogh.

Texture proposal or style transferring is an extension of aesthetics recognition module and is used in order to learn aesthetics style and creator's elements so as to transfer them to another target image with a specific given content. For example Figure 1 shows how an image that depicts the national Konzerthaus in Gendarmenmarkt square in Berlin would look like if it had the style of one of the most famous paintings of Vincent Van Gogh, i.e. "Café Terrace at Night"

Figure 2: The results of V4Design STBOL module in three images from Nico's Weg DW series

In addition, spatiotemporal building and object localization is the automatic way to detect and identify whether and where exactly an object or building is located in an image. The part of the image having a building or object is marked with the same common colour and this area is called mask of it. As we can see in Figure 2, for each detected object in an image its mask is marked with a different colour. This module is challenging because It requires the correct detection of all objects in an image and also classifies each pixel into a fixed set of categories.

If you like what you are reading and would want to have the opportunity to test out V4Design's early prototypes and demos make sure to subscribe to our user group: https://v4design.eu/user-group/