

CHANGE

CULTURAL HERITAGE ANALYSIS
FOR NEW GENERATIONS

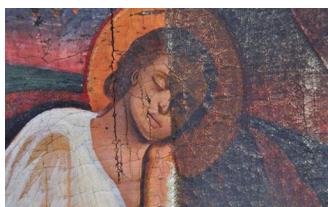
Newsletter - September 2020



Welcome to the CHANGE Newsletter!

We are pleased to send you the first CHANGE Newsletter! In this edition you can get more acquainted with the CHANGE project, learn more about the first year of our project and look into some of the work and activities of our Early Stage Researchers (ESRs). At the very end of the newsletter you can get to know our ESR Evdokia Saiti and her work on developing registration techniques for differential and multimodal data for Cultural Heritage (CH) objects.

What is CHANGE all about?



Have you ever wondered how cultural heritage objects change with time? The objects get affected by different factors, for instance exposure to light and humidity can lead to changes in colour and materials. These inevitable changes can make the object undecipherable to human eye, hence the legacy for future generations is in danger of being lost forever. We need to learn more in order to detect the change, as well as slowing down the process or to restore the objects.

Detecting the first signs of any change and monitoring it are challenging and complex, however, the recent progress of advanced imaging techniques and data processing makes it possible, although it is highly dependent on interdisciplinary cooperation between different actors as conservators, as well as scientists from both Cultural Heritage and Computer Science field.

The CHANGE project will train a new generation of Early Stage Researchers (ESR) towards a common goal, namely the assessment of changes of tangible cultural heritage objects and their monitoring in the atmosphere and/or during their conservation treatment using

multimodal imaging techniques in complement to more traditional analytical techniques. Their research will consist in an optimised capturing of data and their analysis, visualisation, and management to ensure a better documentation and long-term preservation of our common European cultural heritage. This work is being carried out within an interdisciplinary environment involving five cultural heritage and four Information & Communication Technologies (ICT) beneficiary institutions as well as nine cultural heritage, ICT and industrial partners from eight European countries.

[Find out more about CHANGE](#)

First year of CHANGE



The first year of CHANGE is already coming to an end. It has been an inspiring year where we go to meet the 15 Early Stage Researchers (ESRs) that were recruited to the project. You can also get acquainted with them and their research if you click on the link below.

During the first year we have conducted a Kick-Off meeting for the project where all the project partners got to know each other better. In addition, we conducted two training events, one in France in cooperation with C2RMF and CRCC, and one in Norway at NTNU and the University of Oslo. You can read more about the different events on our webpage (links below).

[Get to know our ESRs](#)

[CHANGE Kick-off](#)

[ESR Kick-off Paris](#)

[Training School Norway](#)



It's all about the colours!

Early Stage Researcher Jan Cutajar, has recently been focusing efforts on preparing oil paints and mock-ups of Munch's UiO Aula paintings.

Before selecting materials for experimentation, conservators need to characterise them - here you can see Jan analysing various chromium oxide green paints via FT-IR spectroscopy.

[Read more](#)



3D scan of CH Objects

Check out how Early Stage Researcher Sunita Saha is digitally documenting the restoration process. Photo documentation and 3D scans makes it possible to analyse the surface geometry digitally and make it possible to reconstruct broken pieces.

[Read more](#)

Get aligned and track the CHANGES

To understand what changes the cultural heritage objects undergo over time, a tremendous amount of data needs to be compared, analysed and stored. Scans of e.g. surfaces or minerals generates a lot of data and the datasets are often in different formats and domains. There is a need for these data to be aligned and Early Stage Researcher in CHANGE Evdokia Saiti



works at NTNU - the Norwegian University of Science and Technology on how to automate this process. She recently published a paper describing the challenges of multimodal 3D registration.

Saiti's PhD project is all about developing registration techniques for differential and multimodal data. What does that actually mean? - "My project's goal is to automate the tedious process of registering differential and multi-modal data of cultural heritage objects", Saiti says. - "The research has two main axis, the first one is to develop algorithms for aligning successive surface scans of 3D objects across time and the latter is to identify efficient multimodal registration algorithms without any prior knowledge of correspondence between the modalities. The alignment methods to be developed are going to assess and monitor any change of which Cultural Heritage artifacts are faced

during their exposure to the atmosphere and their conservation treatments", Saiti explains.

Evdokia Saiti started to work as an Early Stage Researcher at NTNU early 2021 and she has already reviewed the state-of-the-art methods for multi-modal registration methods and a

review paper has been submitted. The paper provides a survey of multi-modal 3D registration methods in an application-independent view. The problem of multi-modal 3D registration has been strictly defined and their applications and registration attributions have been discussed. Multi-modal 3D registration is an interesting and challenging problem with a numerous of different applications in Cultural Heritage digitization and preservation process. A good survey on this topic could help other professionals and researchers who are not familiar in this area to better understand the whole picture.

The CHANGE ESR position Saiti currently holds was a much sought-after position when advertised. How come this was a good fit for her? Before becoming an Early Stage Researcher, Saiti worked in the telecommunications industry. – “The CHANGE project was the perfect opportunity to combine my main two interests, computer vision and cultural heritage and it was a great challenge on my career path”, she says. – “My main goal is to obtain a high level, up to date relevant knowledge of techniques to study and monitoring changes on Cultural Heritage objects. Moreover, I’m fascinated by the trends on computer programming and I would like to broaden my programming skills through the topic of my research. Also, the prospect of working and collaborating with researchers from different institutes and having different backgrounds is an interesting and exciting aspect of the CHANGE project. In long term, I’d love to be a true expert on my topic and have expanded my professional network so as to create a plethora of working opportunities in the Cultural Heritage field”, Saiti concludes.

CHANGE publications



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