

CHANGE

CULTURAL HERITAGE ANALYSIS
FOR NEW GENERATIONS

Newsletter - May 2022

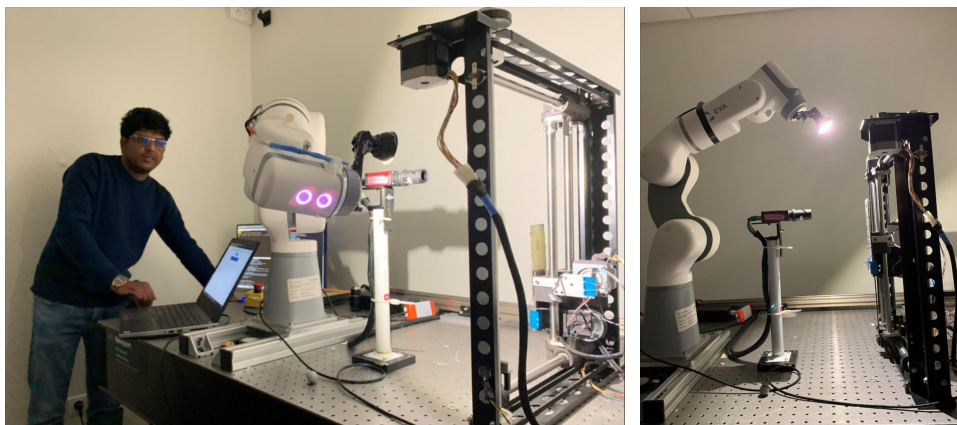


Welcome to this edition of our CHANGE Newsletter!

We have just started the fourth and last year of the CHANGE project and the activities are blooming! In this edition you can read more about the CHANGE School recently held in France, learn more about the research on how visitors perceive appearance of silver museum objects and the last piece will give you a peak into our dissemination tour of the western coast of Norway.

If you need a recap on what CHANGE is all about, make sure you watch our CHANGE Video. Click on the image above or the button below and it will take you to the YouTube channel of CHANGE.

[CHANGE Video](#)



*Photos: Ramamoorthy Luxman is working on the robot arm during the training school in France
(Photo cred: Alexis Komenda)*

CHANGE School France

The event had been postponed several times due to Covid-19, but now it was finally time for the ESRs to visit the University of Burgundy Franche-Comté (UBFC) and the Center for Research and Restoration of Museums of France (C2RMF) to learn more about Reflectance Transformation Imaging (RTI) as well as other imaging tools.

Like the Poland training school, the France training school was primarily hands-on, a quality that was highly cherished by the ESRs. The group started out in Dijon, at UBFC or, more specifically, at *Le laboratoire Imagerie et Vision Artificielle* (ImViA) where the focus was on different kinds of RTI and processing of data as well as data simulations in Blender.

Free-form RTI acquisition, also called highlight RTI, is a challenging and time-consuming technique as it requires one person to take the images with a camera and another to hold the light at different angles. This requires a lot of effort and planning which might be hard to repeat. One of our PhD fellows, Deepshikha Sharma, appreciated the chance of learning more about the research of Ramamoorthy Luxman and David Lewis, the two CHANGE fellows recruited by UBFC. She was very impressed by the work with the robotic arm that is being developed in ImVia for RTI acquisitions and she thinks it is going to be path-breaking if it can also be cost-effective.



Photo: David Lewis
(Photo cred: Yoko Arteaga)

In Paris, both C2RMF and *Institut national du patrimoine* (INP) provided training for the fellows and David Lewis tells us he was introduced to some interesting concepts in both C2RMF and INP. - "I liked that the training at C2RMF was a bit more on the conservation side and INP was a bit more on the scientific side, but both were two sides of the same coin and closely related" he says before he adds that this was according to his point of view. As David is more on the acquisition and processing side of the field, he thought it was interesting and helpful for his career going forward to have a better understanding of how the "other half" of cultural heritage studies works.

Deepshikha on the other hand, who considers herself a conservation scientist, was really impressed by the multi-analysis device developed in-house by Thomas Calligaro (C2RMF). - "He presented a unique device assembled by himself at a very low-cost and it provides inspiration to conservation scientists like me that cost-effective devices can be developed by oneself in one's own institute with a good level of knowledge and resourcefulness", she says before she adds - "this is something inspiring for every one of us who wish to work in a conservation research institute or who wish to start their own consultancy or practice in this field".

In Paris they also learned about black and white photographs developed on silver halide paper and Deepshikha highlighted this as one of her favourite parts of the training. - "This was something I had only seen in movies. To be able to experience the whole complicated long process inside a dark room with so many different trials and chemicals made me appreciate the complexity of imaging techniques before the start of the digital era", she says. This is perhaps not so easily understood in today's world unless you go through the experience yourself. - "For millennials like myself, this is totally unknown unless they try actively to learn the history of imaging. I could understand and value how far the world has advanced in imaging sciences and how easy imaging is in the digital age", she continues.

Socially, the joint dinners served as a nice place to share and learn, as some of the supervisors and other cultural heritage experts joined the fellows also in the evening. All in all, the training event lived up to its expectations and the fellows as well as the organisers can look back on a successful event.



Photo: When in France..
(Photo cred: Alexis Komenda)

How do visitors perceive the appearance of silver museum objects?

When exposed to the atmosphere silver interacts with sulfur creating a uniform and stable layer of corrosion called tarnish. Tarnishing is a slow process that creates alterations to the color appearance of the object, ranging from a yellowish layer and extending to dark colors. Cleaning silver is usually performed for the improvement of the aesthetic appearance of the object and involves the removal, full or partial, of the tarnish layer. During the cleaning process, both monitoring and the extent of cleaning are determined based on visual observations/examination. Equally, when monitoring the condition over time of an object, i.e. to examine its stability in the museum environment, this evaluation is also commonly performed by visual documentation.

However, there are limitations between what eyes can see and what instruments can measure and this plays an important role in the preservation of Cultural Heritage. On the one hand, even a minor change in the appearance can be the sign for a chemical alteration of the surface leading to a change of the object's condition. On the other, the inability of the human eye to detect minor changes on the surface of an object can affect the decision of the cleaning level during conservation.

In an effort to examine these limitations, while trying to create a correlation between human perception and physical measurements, CHANGE PhD fellow Amalia Siatou conducted a psycho-visual survey aiming to collect people's perceptions on the surface appearance of silver.

What is the texture and color of silver? What kind of finishing is preferred for the luxury objects of the past centuries? Do you think the displayed objects are adequately cleaned?

These were the main questions that the psycho-visual examination was inquiring.

138 people, of different age groups, participated in this survey that took place in the Museum of Fine Arts in Dijon. Visitors were asked to evaluate the appearance of a series of selected objects in correlation to artificially tarnished coupons.



Photos: Visitors of different age groups examining the object's perception (Photo cred: Amalia Siatou)

Coupons (metal plates) with different textures (matte, satin, mirror) were artificially corroded to represent different degrees of silver tarnish, demonstrating different surface colors. These coupons were then placed next to real objects of the collection of the Museum of Fine Arts.

By comparing the surface of the coupons to those of the objects we are trying to document the human perception on the visual appearance of silver surfaces.



(Photo cred: Amalia Siatou)

To quantify and classify the visual appearance of silver colorimetric measurements were performed and will be compared with the results of this psycho-visual survey.

This survey aims to shed light to the ongoing project of ESR 15 Amalia Siatou and the effort to detect, characterize and quantify the perception or the change of the appearance, visual or not, of challenging museum objects. The results of the survey are currently under statistical evaluation and will soon be published. Preliminary results show the difficulty in separating textural from color perception on high reflective area, especially in when surface defects like scratches and tarnishing are present. However, regardless of the surface appearance, the majority of visitors accepts their display in a museum without expecting a high lustrous surface.

This project was conducted under the CHANGE program, in collaboration between the Direction des Musées-Mairie de Dijon and Haute-Ecole Arc Conservation-Restauration (HE-Arc CR), Haute Ecole Spécialisée de Suisse Occidentale, Neuchâtel, Switzerland as well as the laboratory of Imagerie et Vision Artificiel (ImViA), Université de Bourgogne-Franche-Comté, Dijon, France.



Dissemination tour of western Norway

Six Early Stage Researchers (ESRs), together with coordinator and project manager of CHANGE headed to the west of Norway to share knowledge and new research in CHANGE, as well as discussing our common passion of preserving cultural heritage.

NO CHANGE, also known as the Norwegian network of CHANGE, is a project funded by the Research Council of Norway. The project aims to increase the impact of the EU project on Norwegian private as well as public sector, including the museum sector. NO CHANGE has previously visited Trondheim and this time, Bergen and Ålesund, two cities on the western coast of Norway hosted the CHANGE group to share the recent achievements in the CHANGE project.

First stop was Bergen, the second largest city in Norway known for its heavy rain, though hard to believe for the first-time visitors as the sun was shining throughout our stay. Our venue was full of staff mostly from the museum sector, eager to listen to the recent advances of change monitoring of cultural heritage objects.



To set the stage, relevant research at the Colourlab was introduced by co-ordinator Jon Yngve Hardeberg, Markus Storeide and Anneli T. Østlien (NTNU) before Agnese Babini (NTNU) presented her project on stained glass windows.



Photo: Evdokia Saiti presenting

Her introduction to challenges of documenting the transparent stained-glass windows was a good start to the CHANGE presentations and Evdokia Saiti (NTNU) followed up nicely with the presentations of the work she has been doing on registration of 3D data of stone or marble objects. Evdokia demonstrated how the technology could help indicating erosion of marble objects over time.

Introducing technology to different applications might not be easy, but our ESRs sure did an excellent job and when Ramamoorthy Luxman (University of Bourgogne, Franche-Comté) showed the robotic arm changing the angle of the light source as the camera documented the artwork, many cameras of the audience were also busy preserving for posterity when taking photos of the impressive device Ramamoorthy showed on screen.

The audience also learned about the measurement of appearance of an object from Yoko Arteaga (Center for Research and Restoration of Museums of France). Measuring appearance is important to know for the conservators when they decide on what methods or technique to use when restoring an object to appear as similar to the original object as possible. Dipendra Mandal (NTNU) showed how he is researching to overcome the challenges of scanning with Hyperspectral cameras on an uneven surface a painting usually has, before Jan Cutajar (University of Oslo) wrapped it all up with a presentation of the work he has conducted on monitoring the changes of the monumental paintings by Munch in the Aula of the University of Oslo.

After a day of presentations, Hana Lukesova and some of her colleagues from the University Museum of Bergen took the group for a steep hike up “Fløyen” for a nice view of Bergen by night. They also invited us to the University Museum the day after where we learned more about their work and their collections.



Photo: Bergen by night

When travelling on the west coast of Norway, what better way is there than joining the Norwegian Coastal Express overnight? We couldn't think of any and enjoyed a beautiful journey along the coast. With barely any wind, a clear sky and no interfering city lights, we could easily look for different stellar constellations.

The journey went on to Ålesund, where we held the same presentations for a new audience. This was hosted by NTNU's long-term cooperation partner Ottar André Breivik Anderson, head of Photography and Image Services at the Møre og Romsdal county centre of cultural heritage digitization. Ottar also hosted the ESRs at their premises the day after, to work on quality analyses of reflective and of transmissive targets for flat art reproduction.

All in all, the NO CHANGE tour of the western Norway was a good exercise for the ESRs to practice their communication skills targeting an audience also outside academia and scientific conference, in this case to potential end users. It provides a confidence boost of the project when the audience in Ålesund is excited to know when this technology will be available for the museum staff to use.



Photos: Top left hand side: Five PhD fellows watching the sunrise from the Norwegian Coastal Express. Top right hand side: PhD fellows fishing from the "Storeggen" a replica ship from the VITI museum. Photo at the bottom: NO CHANGE group outside NTNU in Alesund (Photo cred: Piotr Cabaj)

CHANGE Publications

CHANGE

CULTURAL HERITAGE ANALYSIS
FOR NEW GENERATIONS



CHANGE is funded by the Horizon 2020 programme of the European Union. Grant Agreement #813789



change-itn.eu/



[@ITNCHANGE](https://www.facebook.com/ITNCHANGE)



[@ITNCHANGE](https://www.instagram.com/ITNCHANGE)



[@CHANGEITN](https://twitter.com/CHANGEITN)

CHANGE, MSCA-ITN - NTNU, P.O. Box 191 / Teknologivegen 22, 2815 Gjøvik, Norway

[Unsubscribe](#)