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Application of Digital Non-Destructive Technologies for Museum Artefacts

The last decade has seen ground-breaking advances in computer technology, both in its development and in its use. The use of digital, non-destructive technologies for movable cultural heritage has increased enormously. Both users and experts can gain new information and insights, and the new technologies are creating a range of new experiences. The digitisation process can be seen as a multi-step process. One of the steps is digital capture. The purpose of digital capture is to create a digital copy of a cultural asset. Such copies can be achieved through various source-based captures, e.g. sound, electromagnetic waves, X-rays, etc. ZAG covers most of these non-destructive technologies, but in this talk, I would like to introduce you to the field of XCT and laser scanning in conjunction with 3D printing. With the advent of 3D printing, it is now possible to reproduce both small and large replicas with extreme precision and at a scalable scale. The technology of particle bed-based 3D printing is particularly suitable for this. Various museum artefacts and their replicas will be presented, which were created in collaboration between the NMS and the SEM.

Dr Lidija Korat, BSc in Geology, PhD in Built Environment, Scientific Associate at the Slovenian National Building and Civil Engineering Institute (ZAG). Lidija is nationally and internationally recognised as an advanced user and analyst of X-ray computed microtomography (microXCT). She was instrumental in establishing the latter technique at ZAG, which remained unique in Slovenia for 10 years. She also paved the way for digital manufacturing by setting up the particle-bed 3D printer and investigating materials suitable for digital manufacturing in construction. Her research work focuses on reverse engineering, a combination of 3D printing and microXCT, for the restoration and preservation of ancient artefacts and cultural heritage. Last but not least, Lidija is also recognised for her social contributions. She is committed to cultural heritage research, spreading her knowledge through exhibitions and supporting the new generation of professionals through mentoring engagements. However, she is most proud of her contribution to the production of the model of the Carniolan honeybee, which was exhibited at the World Expo in Dubai in 2022 as a central element of the Slovenian pavilion.

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