

## SUMMARY

The aim of the thesis „Application of photogrammetry for museum object conservation and documentation“ is to create a 3D model of a Late Baroque style cabinet owned by the Estonian National Museum using photogrammetry. In addition to creating the model, it addresses data acquisition, processing, and the possibilities and results of using processed data. The work aims to emphasize the importance and value of 3D digitization in Estonian museums.

Therefore, the thesis explores the important role of 3D documentation and digitization in the preservation of cultural heritage. Museums have started to use 3D documentation to enhance traditional methods, improving preservation, conservation, and research of museum objects by creating digital twins. The digitization process involves project planning, database creation, and ensuring long-term sustainability. 3D digitization is important for conserving and restoring endangered cultural heritage, providing virtual access to physically inaccessible objects, for example that it is too fragile to handle for large audience. Also protecting them from threats such as excessive degradation from handling the object, theft, war, climate change and natural disasters.

The primary focus of this thesis was on photogrammetry as a 3D documentation technique, outlining the main steps and creating a 3D model. Photogrammetry is a method of 3D documentation that involves capturing multiple photographs of an object from various angles and processing them with specialized software to generate accurate 3D models.

The second chapter covered data acquisition and creating a 3D model of a Late Baroque style cabinet (ERM D 15: 168). The cabinet was disassembled into 14 parts, allowing for detailed digitization. Agisoft Metashape Professional software was used for data processing to create individual 3D models of each component.

During data processing, technical challenges were encountered, requiring several repeated photo alignments and mesh model creations. Photogrammetry's limitations during data acquisition, particularly in narrow and dark areas, highlighted the need for different approaches.

The third chapter focused on the potential applications of the 3D model, the processing, and analysis of the generated 3D model using software programs such as Blender and online 3D platform Sketchfab and Nira.app. The thesis supervisor, Andrei Bljahhin, combined the individual 3D models into a complete model using Blender. The final 3D model of the cabinet

can be examined on Sketchfab, and Nira.app was used to mark conservation repair works based on Estonian National Museum conservator Indrek Tirrul's guidance.

The thesis gave me a lot of experience in a specific professional field, through which I got to know photogrammetry in detail, and I learned significantly more about the importance of 3D models in the field of cultural heritage.