

Gaining INSIGHT: exploring the application of Artificial Intelligence to the automatic classification of cultural heritage objects

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Many cultural heritage collections are nowadays going through a phase of mass-digitisation, whereby the objects are digitised, catalogued and published at an unprecedented scale using computational means. This process is challenging because of the rapid pace that it progresses. The digitisation of cultural artefacts itself is a time-consuming process and yet, in the end, only yields low-level data (e.g. raw scans) which need to be supplemented with descriptive metadata to become practically useful (e.g. assign a period of composition to a painting; describe the subject of a photograph etc.). This process is known as (semantic) data enrichment. Such metadata is often assigned using thesauri (e.g. Art and Architecture Thesaurus) that provide a standardised terminology ('controlled vocabularies' to characterise cultural artefacts. While crucial to both curation and research, such annotations are still expensive to obtain, because they are provided manually by domain experts.

In recent years, artificial intelligence (A.I.) – the activity by which computers achieve results that usually require human intelligence – has found its way into the cultural heritage sector. A.I. is applied to cultural heritage data to enhance the user experience, for example by creating tools that support the museum visitor in the creation of a personal “narrative trail” (Mulholland et al., 2016) or by developing virtual tour guides (Lim et al., 2007). However, the application of A.I. to the daily activities performed by cultural heritage professionals, such as the automation of certain time-consuming and expensive tasks, is yet to be fully explored.

[INSIGHT](#) (Intelligent Neural Systems as InteGrated Heritage Tools), is a research project funded by the Belgian Science Policy Office (BELSPO). It aims to deploy recent advances in Artificial Intelligence (language technology and computer vision in particular) to support the enrichment of the descriptive metadata of the collections of the Royal Museums of Fine Arts of Belgium and the Royal Museums of Art and History. The objective of this project is to advance the application of automated algorithms from the field of Artificial Intelligence (AI) to support cultural heritage institutions in their effort to keep up with their ongoing annotation efforts for their expanding digital collections. We will determine how state-of-the-art algorithms can be used to (semi-)automatically catalogue and describe digital objects, especially those for which no, little or incomplete metadata is available.

In this short paper, following a brief introduction to the INSIGHT project, we will explore to what extent A.I. can automate the annotation of iconographic elements in works of art, i.e. without human intervention (Sabatelli, 2018). To demonstrate this, we will present the initial findings of a

case study to investigate whether a test collection of photographs of musical instruments can be automatically classified using the [Musical Instrument Museums Online \(MIMO\) Thesarus](#). Finally, we will look to future research directions, such as whether such algorithms could be trained to detect musical instruments in works of art.

References

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