**Ph.D. in Information Technology**
**Thesis Defense**

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**at 14:30**
**Room Conferenze "Emilio Gatti"**

**Federico MILANI** – XXXV Cycle

## ANALYSIS OF CULTURAL HERITAGE DATA FOR COMPLEX ICONOGRAPHY STUDIES

Supervisor: Prof. **Piero Fraternali**

**Abstract:**

With the massive digitalization of artworks and the increasing availability of open access online sources, researchers can thoroughly investigate the history of art and the evolution of motifs and themes across space and time. However, most available resources do not offer high quality images and most data sets comprise low quality or scarce annotations, which increases the difficulty of the analysis tasks. This is especially true in the case of iconography analysis, the branch of the history of art that studies the subject matter or meaning of works of art. Classifying artwork by their iconography with computer-aided tools is a novel research objective and still presents non-trivial challenges besides the quality of data. The research work of this thesis aims to explore novel Artificial Intelligence architectures to correctly identify and localize iconographic elements in artworks while dealing with challenges presented by noisy annotations and low quality data. For such purposes, a paintings dataset has been collected and annotated, methods to train Convolutional Neural Networks classifiers have been selected and evaluated, and a two-stage Weakly Supervised Object Detection architecture has been proposed. Ultimately, the results can provide novel augmented reality experiences, or enrich online collections with metadata that otherwise would be too time-consuming to obtain.

**PhD Committee**

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