

# AI and Artworks: Object Detection, Image Classification and Iconographic Analysis



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## Embedding-Based Image Analysis for Art Historical Research: Integrating AI into Digital Catalogues Raisonnés

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Navigating.art is developing an AI-assisted image analysis feature within an existing platform that enables art researchers to record, manage, and publish digital catalogues raisonnés anchored in a relational database. The new feature leverages amazon.titan-embed-image-v1 (AWS Bedrock) to generate 384-dimensional vector embeddings, representing individual artworks and detected subregions in a multidimensional semantic space. These embeddings are designed to support similarity search, clustering, and visual discovery across large digitized collections, extending the platform's capabilities for reverse image search and comparative analysis.

The embedding pipeline is implemented using a serverless architecture with AWS Step Functions, orchestrating image acquisition, computer vision-based detection of rectangular regions, OCR via Textract, and embedding generation. Parallel processing, exponential backoff, and automated optimization ensure scalability and robustness, while results are consolidated and made accessible via the platform's relational database and callback mechanisms.

A key challenge remains: the large language models with vision capabilities currently used interpret an entire page as a single image, complicating reverse image search for individual works. Addressing this limitation is central to ongoing development, alongside improving subregion detection and embedding quality. By April 2026, we anticipate presenting a working prototype and preliminary results, demonstrating how embedding-based AI can enrich catalogues raisonnés by enabling visual pattern recognition, iconographic comparison, and cross-collection research.

This work illustrates a pragmatic, ethically grounded approach to integrating AI into art historical scholarship, bridging computational methods with established scholarly practice in a scalable and accessible manner.

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