# Between Text and Icon: Towards A Representational Model for Ekphrastic Relations

Maria Francesca Bocchi<sup>1</sup>, Carlo Teo Pedretti<sup>2</sup>, Fabio Vitali<sup>3</sup> <sup>1</sup>University of Bologna, Italy - maria.bocchi4@unibo.it <sup>2</sup>University La Sapienza of Rome, Italy - carloteo.pedretti@uniroma1.it <sup>3</sup>University of Bologna, Italy - fabio.vitali@unibo.it

# ABSTRACT

Especially before the current, markedly visual-dominated society, ekphrasis, i.e. the textual description of art objects as a formal analysis of them, was regarded as a vital component in discourses about art history, aesthetics and transmediality. Beyond its classical roots, modern perspectives on ekphrasis explore its role in intermediality and visual studies, emphasizing the dynamic relationships between text and image. Supported by the increasing diffusion of Semantic Web technologies, several interdisciplinary research fields leverage theoretical frameworks close to iconology to pursue quantitative art history with computational methods. Nevertheless, while iconographic studies have been recently addressed in ontologies, a complete description of aspects relevant to ekphrasis is still missing. This paper provides a structured formalization of ekphrasis, enabling scholars to annotate, compare, and visualize the interpretive layers of ekphrastic descriptions across multiple works. The presentation, therefore, aims to: (1) survey the theoretical background regarding ekphrasis to represent a formal model by extending and reusing existing ontologies; (2) apply the proposed ontology to the peculiar case study of Giuseppe Raimondi's writings; and (3) create an annotator prototype to leverage the model.

Keywords: ekphrasis; annotations; ontologies; IIIF; Web Annotation Data Model.

# **ABSTRACT (ITALIANO)**

## Tra Testo e Icona: verso un Modello Formale per le Relazioni Ecfrastiche

L'ecfrasi, ossia la descrizione testuale di oggetti artistici intesa come analisi formale degli stessi, è considerata un elemento fondamentale nei discorsi sull'estetica, la storia dell'arte e la transmedialità. Oltre alle sue radici classiche, le prospettive moderne sull'ecfrasi ne esplorano il ruolo nell'intermedialità e negli studi visivi, ponendo l'accento sulle relazioni dinamiche tra testo e immagine. Con il crescente utilizzo delle tecnologie del Web Semantico, prospettive teoriche vicine all'iconologia hanno sfruttato metodi computazionali nel campo della storia dell'arte. Tuttavia, sebbene siano stati proposti modelli formali relativamente agli studi iconografici, manca ancora una descrizione completa degli aspetti rilevanti per l'ecfrasi. Il contributo propone una formalizzazione strutturata dell'ecfrasi, permettendo agli studiosi di annotare, confrontare e visualizzare i livelli interpretativi delle descrizioni ecfrastiche. La presentazione si propone quindi di: (1) analizzare il panorama teorico relativo all'ecfrasi al fine di rappresentare un modello formale, estendendo e riutilizzando ontologie esistenti; (2) applicare l'ontologia proposta al caso di studio degli scritti di Giuseppe Raimondi; infine, (3) sviluppare un prototipo di annotatore basato sul modello proposto.

Parole chiave: ecfrasi; annotazioni; ontologie; IIIF; Web Annotation Data Model.

# 1. INTRODUCTION

This paper explores ekphrasis through the lens of Semantic Web technologies, proposing a formal model that leverages existing ontologies while addressing the limitations of previous approaches. Ekphrasis traditionally refers to a vivid, often dramatic verbal description of a visual work of art. While in its classical form ekphrasis specifically involved verbal representations of paintings, sculptures, or other visual artworks, taking shape as a specific literary genre with distinct rhetorical techniques, contemporary usage of the term can be broader, encompassing the description of any non-verbal object or scene through the medium of language.

In particular, mimetic (or real) ekphrasis describes an actual, physically existing work of art. For example, J.J. Winckelmann's description of the *Laocoon* (Winckelmann, 2001), or D.G. Rossetti's sonnets on his paintings (Rossetti, 2010). Notional (or imagined) ekphrasis instead describes an artwork that does not exist outside the text itself—sometimes called "fictional ekphrasis" (Hollander, 1995; Krieger, 1992). A classic example is the shield of Achilles in the Iliad, which may be more a product of Homer's imagination than an actual shield. Examples also include ekphrasis as an essential mechanism for the remediation and

description of lost artworks and objects of uncertain attribution. More complex cases, such as Max Aub's ekphrasis of fictional paintings, later on physically created by the author himself, can be seen as a unique hybrid or "self-fulfilling" form of ekphrasis, collapsing the boundary between "fictional" and "actual" art (Aub, 1992).

In addition to the ontological relationship between its textual and iconic referents, the ekphrasis itself is often employed to produce a particular rhetorical effect on the reader. At its simplest level, ekphrasis acts as a denotation, exemplified by the explicit mention of a painting and its attributes in a text (Cometa, 2012). These forms of denotation—which resemble straightforward descriptive modes (as in hypotyposis) (Eco, 2002)—can classically be introduced by deictic expressions (such as "this," "that," etc.) and are typically accompanied by simple iconographic cues that literally point out the meanings of what is depicted (Cometa, 2012: 86; Voilloux, 2005). They could be used by the writer as a means not only to describe but also to dramatize or enact dynamization, possibly imagining events unfolding in the described scene. Homer's description of the shield, for instance, depicts city scenes in motion, almost as if they were living dioramas. Finally, the ekphrasis could also integrate the image with reference to the recipient's personal and cultural experiences, e.g. by supplying historical or stylistic context and adding hermeneutical interpretation of the image.

In the following sections, we provide a brief overview of the domain of ekphrasis and annotation, along with a discussion of related works. We then introduce a formal model for describing ekphrasis and apply it to a case study based on the writings of Giuseppe Raimondi. Finally, an annotator prototype designed to leverage the proposed ekphrastic ontology is presented.

## 2. RELATED WORKS AND DOMAIN

Given its dyadic structure, linking textual and iconic referents, ekphrasis operates as and can be effectively modeled through annotations. However, it's important to stress that ekphrasis itself is not an annotation; rather, annotations provide a structured and interpretative digital representation of ekphrastic discourse. From a general point of view, annotating is the act of associating different pieces of information together (Sanderson et al., 2013). Indeed, annotations establish a 'dialogic structure' (Boot, 2009) between two entities by explicitly linking a passage of text or an image to its translation, explanation, or another artifact, thus situating and providing insights into the use of the annotated object in a specific context. Furthermore, an annotation always consists of three components, namely: (1) an *annotatum*, something being annotated, the target; (2) an *annotans*, something predicated on the target, the annotation content; and (3) an annotator, who applies the *annotans* to the *annotatum*. Finally, the relationship between the *annotatum* and the *annotans* must be meaningful (Boot, 2009).

As discussed, ekphrasis conveys complex meanings and can establish multiple forms of interaction with its iconic referent. These forms may vary in nature—sometimes focusing on iconographic details, other times on deeper iconological themes. For this reason, ekphrasis should be viewed not as a single annotation but rather as a network of annotations referencing distinct facets or interpretive levels of one or more works of art, and potentially drawing comparisons between them. More importantly, an ekphrasis is a natural-language description created by an author. Conversely, an annotation is a formal, structured representation derived from the ekphrasis, produced by a different interpreter for analytical purposes. Thus, annotations cannot be conflated with the ekphrasis proper, for they arise from a separate hermeneutic event—one that is second-order in nature and possibly driven by a different agent. Therefore, the process of dividing an ekphrasis into annotations results from a subsequent interpretive act performed by a reader other than the original author.

Formally, given an ekphrasis *E*, we can represent it through a set of structured annotations *A*:

#### $E (modeled as) \rightarrow A \subseteq T \times I$

Where *T* is the set of textual referents (the *annotans*, or "body"), and *I* is the set of iconic referents (the *annotatum*, or "target"). Each annotation  $a \in A$  explicitly encodes an interpretative link between specific text fragments and image details. Moreover, this separation enables the model to be deployed in scholarly tools for analyzing and interpreting literary phenomena since it distinguishes the original text from the subsequent analytical process.

Practically, we anticipate ekphrasis to be represented by multiple annotations, each capturing distinct interpretative aspects or rhetorical strategies.

From a technical standpoint, a scholarly semantic annotation platform tailored for large-scale visual heritage was introduced, leveraging linked open data and ontologies like CIDOC-CRM to facilitate detailed

annotations and provenance tracking (Chau et al., 2024). The ICON ontology, aligning with Panofsky's three levels of iconological interpretation, offers a granular representation of artistic subjects and symbolic meanings (Sartini et al., 2023), while the MythLOD ontology interlinks ancient mythological motifs with visual representations (Pasqual & Tomasi, 2022). While these approaches underscore the potential of semantic frameworks for visual heritage and iconological studies, ekphrasis as a rhetorical and intermedial phenomenon still lacks consideration.

# 3. GENERAL EKPHRASTIC ANNOTATION ONTOLOGY

To leverage the theoretical framework discussed above, the present work introduces the General Ekphrastic Ontology (hereafter GEkO), a conceptual model aiming at representing ekphrasis within the digital domain. It reuses standard ontologies such as the Library Reference Model Object-Oriented<sup>1</sup> (LRMoo), the CIDOC Conceptual Reference Model<sup>2</sup> (CIDOC-CRM), the Web Annotation Data Model standard<sup>3</sup> (WADM), the Historical Context Ontology<sup>4</sup> (HiCO), and the Provenance Ontology<sup>5</sup> (PROV-O). As a case study, we compiled a dataset of ekphrases written by Giuseppe Raimondi, an Italian writer and art critic active until the late 1970s<sup>6</sup>. His archive, housed at the University of Bologna, offers a rich collection of heterogeneous materials, including handwritten notebooks with notes and drafts on artistic phenomena. The ekphrases were manually transcribed from these notebooks and encoded in XML for analysis.

The model consists of two main components: the ekphrasis layer and the annotation layer. The ekphrasis layer focuses on the class geko:Ekphrasis, which defines the relationship between two key elements: the textual component (geko:hasTextualReferent), represented as an 1rmoo:F2\_Expression, and the visual component (geko:hasIconicReferent), represented as an 1rmoo:F1\_Work. Additionally, this layer specifies the form of ekphrasis using the property geko:hasForm, distinguishing between mimetic ekphrasis (geko:Mimetic), where the visual referent exists, and notional ekphrasis (geko:Notional), where the visual referent is fictional or lost. Specifically, 1rmoo:F1\_Work has been selected to represent cases of notional ekphrasis, where the referenced visual item does not exist as a material object. The ontology also includes the property dct:creator, identifying the author of the ekphrastic text. Therefore, an instance of geko:Ekphrasis represents the original, holistic textual description of an artwork, as authored by the scholar (in this case, Giuseppe Raimondi). It is a piece of natural language discourse existing independently of any digital modeling activity.



Figure 1. The formal model for General Ekphrastic Ontology.

- <sup>4</sup> <u>http://purl.org/emmedi/hico</u>.
- <sup>5</sup> <u>https://www.w3.org/TR/prov-o/</u>.

<sup>&</sup>lt;sup>1</sup> <u>https://repository.ifla.org/items/94aedb49-2d6e-4a6d-9974-f33abb7e3c0e</u>.

<sup>&</sup>lt;sup>2</sup> <u>https://cidoc-crm.org/</u>.

<sup>&</sup>lt;sup>3</sup> <u>https://www.w3.org/ns/oa</u>.

<sup>&</sup>lt;sup>6</sup> For an overview on Giuseppe Raimondi see (Tortora, 2021).

The second layer of the model considers ekphrasis as being composed of multiple parts (prov:Collection, prov:hadMember), each represented by an individual annotation. To address the specificity of ekphrasis rhetorical modalities, the property geko:hasEkphrasticModality was introduced, linking annotations to one of three rhetorical modes (Cometa, 2012): geko:Denotation, geko:Dynamization, and geko:Integration. These categories reflect distinct discursive strategies within ekphrasis: geko:Denotation captures the referential naming or listing of visual elements (e.g., "a red cloak," "three figures"), geko:Dynamization refers to the textual animation of the image, where static elements are narrated as actions or processes (e.g., "the goddess strides forward"), and geko: Integration denotes the blending of the visual content with the observer's interpretive or emotional response, embedding the artwork into a broader semantic or narrative frame (e.g., "a divine presence invades the scene"). This provides annotators with a granular framework for tracing rhetorical phenomena within the text. As such, an instance of oa: Annotation represents a formalized portion of this textual description, explicitly identified, isolated, and digitally annotated by a modeler for a particular analytical goal. Thus, the annotation captures the interpretive perspective, intent, and methodological framework of the annotator. Annotations, following the WADM specification, are atomic entities and thus cannot contain other annotations. Collections or grouping constructs (e.g., prov:Collection) should instead be used explicitly to group annotations that share common interpretative or rhetorical features.

Moreover, the annotation layer integrates the Multi-Level Annotation Ontology<sup>7</sup> (MLAO) (Pedretti et al., 2024). MLAO introduces the concept of the mlao: Anchor, which specifies the intentional object of the annotation (i.e., the specific conceptual entity an annotator considers during the annotation process), potentially distinct from the annotation target itself (Bradley, 2012). For instance, in the annotation of "a radiant halo encircles the saint's head", the textual span is the annotation target, while the mlao: Anchor might refer to the conceptual notion of holiness or divine election invoked by the halo. The anchor allows further refinement by linking to a conceptual level (mlao:hasConceptualLevel), chosen among iconographic stages (icon:PreiconographicalSubject, icon:IconographicalSubject, icon:IconologicalSubject). Additionally, the anchor can be linked via mlao: isAnchoredTo to the corresponding "real-world entity" (crm:E1\_Entity) referenced by the annotation, such as a specific character in the ekphrastic text—e.g., St. Peter, identified through an authority file or controlled vocabulary. This entity could overlap with the iconic referent of the ekphrasis, maintaining a coherent connection between the model's levels. The anchor itself is shared by the ekphrastic annotation and the image annotation produced on the image, maintaining a connection between text and image at the data level. Each ekphrastic annotation has at least two targets (oa:hasTarget), both linking to informational structures. One target connects to a digital reproduction of the image via a canvas in a IIIF manifest (sc:Canvas, sc:Manifest), while the other references a digital reproduction of the text (oa:Text), which corresponds to the textual referent of the general ekphrasis. Additionally, the model incorporates the HiCO ontology to align annotations with acts of interpretation (hico:InterpretationAct), categorized into specific types (hico:InterpretationType) and further defined by interpretation criteria (hico:InterpretationCriterion). This alignment ensures a structured representation of the interpretive process.

<sup>&</sup>lt;sup>7</sup> http://w3id.org/mlao.



Figure 2. An example of an annotated ekphrasis: G.Raimondi's text on J.A.D. Ingres' painting *Mademoiselle Caroline Rivière*.

An example from Raimondi's case study helps illustrate the theoretical framework discussed. Figure 2 describes Raimondi's ekphrasis on *Mademoiselle Caroline Riviére* (1806), a painting by Jean-Auguste-Dominique Ingres, alongside an annotation example. The ekphrasis adopts a mimetic form, as it describes an existing artwork. The textual referent originates from a passage in Raimondi's notebook titled *I disegni "romani" di Ingres. Agosto 1958*, written in 1958, while the iconic referent corresponds to Ingres' painting, linked to its Wikidata entity for precise identification. The ekphrastic annotation selects a specific passage from the text where the annotator identifies a dynamization—an "animated" description of Mademoiselle Riviére's dress<sup>8</sup>. This annotation is anchored to an iconographical subject, namely the figure of Caroline Riviére to which it is conceptually tied. Additionally, the annotation represents an act of literary interpretation and analysis performed by scholars based on their expertise.

## 4. EKPHRASTIC ANNOTATOR PROTOTYPE

To evaluate the relevance of the GEkO model we developed a prototype annotation client<sup>9</sup> (Fig. 3). The prototype is built as an extension of the existing Mirador<sup>10</sup> Annotation plugin and shares its core features and part of its user interface while incorporating the possibility to produce annotations according to classes.

In particular, this extension was designed to support ekphrastic text (Fig. 3, left side) as well as multi-level semantic annotations, while integrating domain standards into the JSON-LD model produced through the Mirador annotator. The annotator prototype incorporates NER functionality to facilitate the recognition of person names, fictional characters, and descriptive attributes.

<sup>&</sup>lt;sup>8</sup> "[...] Infilato fra il busto leggero e i lunghi guanti di vitello giallo, il boa, il serpente di piuma (vuoto all'interno) di latte spumoso, allunga infinitamente le sue spire come il collo timido del cigno di Leda. Il capino del cigno, del boa, si perde in un ciuffo di alghe verdi."

<sup>&</sup>lt;sup>9</sup> The annotation prototype client is available at the following link: <u>https://github.com/friendlynihilist/geko-annotator</u>.

<sup>&</sup>lt;sup>10</sup> <u>https://projectmirador.org/</u>.



Figure 3. A screenshot of the annotator prototype. When a textual annotation is manually selected, the corresponding iconic annotation is highlighted.

From a User Interface perspective, a user can annotate both the image and the text. By highlighting a portion of the text or selecting an area of the image, a popup with autocomplete select dropdowns appears, allowing to populate GEkO properties by defining values from a taxonomy or to create new entries on the fly. The custom dropdowns dynamically inject extended metadata into a JSON-LD, which is later serialized in RDF and stored in a triplestore. This setup ensures that the annotations are stored persistently and fully interoperable. Finally, after having manually created annotations, SPARQL queries based on the Competency Questions were employed to validate the adherence of the model to the extended data schema<sup>11</sup>. Future work will include conducting structured evaluations with domain experts and digital humanities practitioners to assess and refine the prototype's usability and practical impact in real-world scholarly contexts, ensuring GEkO effectively meets diverse scholarly needs.

# 5. RESULTS AND FINDINGS

The study introduces the GEkO formal model, designed to represent ekphrasis in the digital domain. GEkO effectively bridges textual and visual references by extending and integrating established domain ontologies. The model captures crucial rhetorical modalities of ekphrasis (denotation, dynamization, and integration) and enables multi-level semantic annotations linking text and images. Specifically, the study analyzed a dataset of Raimondi's ekphrases, showcasing how textual elements dynamically interact with visual references. Using GEkO, the text-image relationship was formalized as structured annotations, highlighting the rhetorical techniques and interpretive layers embedded in Raimondi's prose. The prototype annotation client, developed to evaluate the GEkO model, enables users to create semantically enriched annotations by linking portions of text to specific areas of an image while dynamically integrating metadata into RDF outputs.

The primary goal of the GEkO model is currently focused on scholarly documentation and enhanced information retrieval. However, future developments will concern further extensions of the model, considering, in particular, its presence in inventories and wills to trace the chain of custody and verify the authenticity of artworks over time, as well as providing automatic ways (e.g. leveraging Semantic Web reasoners) to compare and suggest candidate annotations and exploring the use of AI-driven image recognition to automatically link visual elements with corresponding textual references.

## ACKNOWLEDGMENTS

This work was partially funded under the National Recovery and Resilience Plan (PNRR), Project PE 0000020 CHANGES - CUP J33C22002850006, Mission 4 Component 2 Investment 1.3, funded by the European Union - NextGenerationEU.

<sup>&</sup>lt;sup>11</sup> The resulting knowledge graph was validated against competency questions to ensure it adheres to domain requirements. All relevant files can be found in the Zenodo repository: <u>https://doi.org/10.5281/zenodo.14743534</u>.

## REFERENCES

Aub, M. (1992). Jusep Torres Campalans. Sellerio. (Original work published 1958).

- Boot, P. (2009). Mesotext: Digitised Emblems, Modelled Annotations and Humanities Scholarship. Amsterdam University Press. https://doi.org/10.5117/9789085550525.
- Bradley, J. (2012). Towards a Richer Sense of Digital Annotation: Moving Beyond a 'Media' Orientation of the Annotation of Digital Objects. Digital Humanities Quarterly, 006(2).
- Chau, T. K., Jaquet, D., & Kenderdine, S. (2024). Towards an Annotation Data Model for a Scholarly Semantic Annotation Platform in Visual Heritage: A Case Study Using the Murten Panorama. In Bikakis, A., Ferrario, R., Jean, S., Markhoff, B., Mosca, A., Nicolosi Asmundo, M. (Eds.), SWODCH'24: International Workshop on Semantic Web and Ontology Design for Cultural Heritage. CEUR Workshop Proceedings. https://ceur-ws.org/Vol-3809/paper1.pdf.
- Cometa, M. (2012). La scrittura delle immagini: Letteratura e cultura visuale. Raffaele Cortina Editore.
- Eco, U. (2002). Sulla letteratura. Bompiani.
- Hollander, J. (1995). The gazer's spirit: Poems speaking to silent works of art. University of Chicago Press.
- Krieger, M. (1992). Ekphrasis: The Illusion of the Natural Sign. The John Hopkins University Press.
- Pasqual, V., & Tomasi, F. (2022). Linked open data per la valorizzazione di collezioni culturali: Il dataset mythLOD. AIB studi, 62(1), 149–168. https://doi.org/10.2426/aibstudi-13301.
- Pedretti, C. T., Bocchi, M. F., Tomasi, F., & Vitali, F. (2024). What Do We Annotate When We Annotate? Towards a Multi-Level Approach to Semantic Annotations. In Salatino, A., Alam, M., Ongenae, F., Vahdati, S., Gentile, A., Pellegrini, T. & Jiang, S. (Eds.), Knowledge Graphs in the Age of Language Models and Neuro-Symbolic AI. (pp. 370–385). IOS Press. https://doi.org/10.3233/SSW240030.
- Rossetti, D. G. (2010), Scritti, poesie, lettere. Abscondita.
- Sanderson, R., Ciccarese, P., & Van de Sompel, H. (2013). Designing the W3C open annotation data model. Proceedings of the 5th Annual ACM Web Science Conference, 366–375. https://doi.org/10.1145/2464464.2464474.
- Sartini, B., Baroncini, S., Van Erp, M., Tomasi, F., & Gangemi, A. (2023). ICON: An Ontology for Comprehensive Artistic Interpretations. Journal on Computing and Cultural Heritage, 16(3), 1–38. https://doi.org/10.1145/3594724.
- Tortora, M. C. (2021). Un profilo di Giuseppe Raimondi (1898-1985). KEPOS, Anno IV(I), 130-155.

Vouilloux, B. (2005). La peinture dans le texte: XVIIIe-XXe siècles. CNRS éd.

Winckelmann, J. J. (2001), Pensieri sull'imitazione. Aesthetica Edizioni. (Original work published 1755).