

# Heritage enrichment using spatial object relations

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## Context: manual artwork descriptions

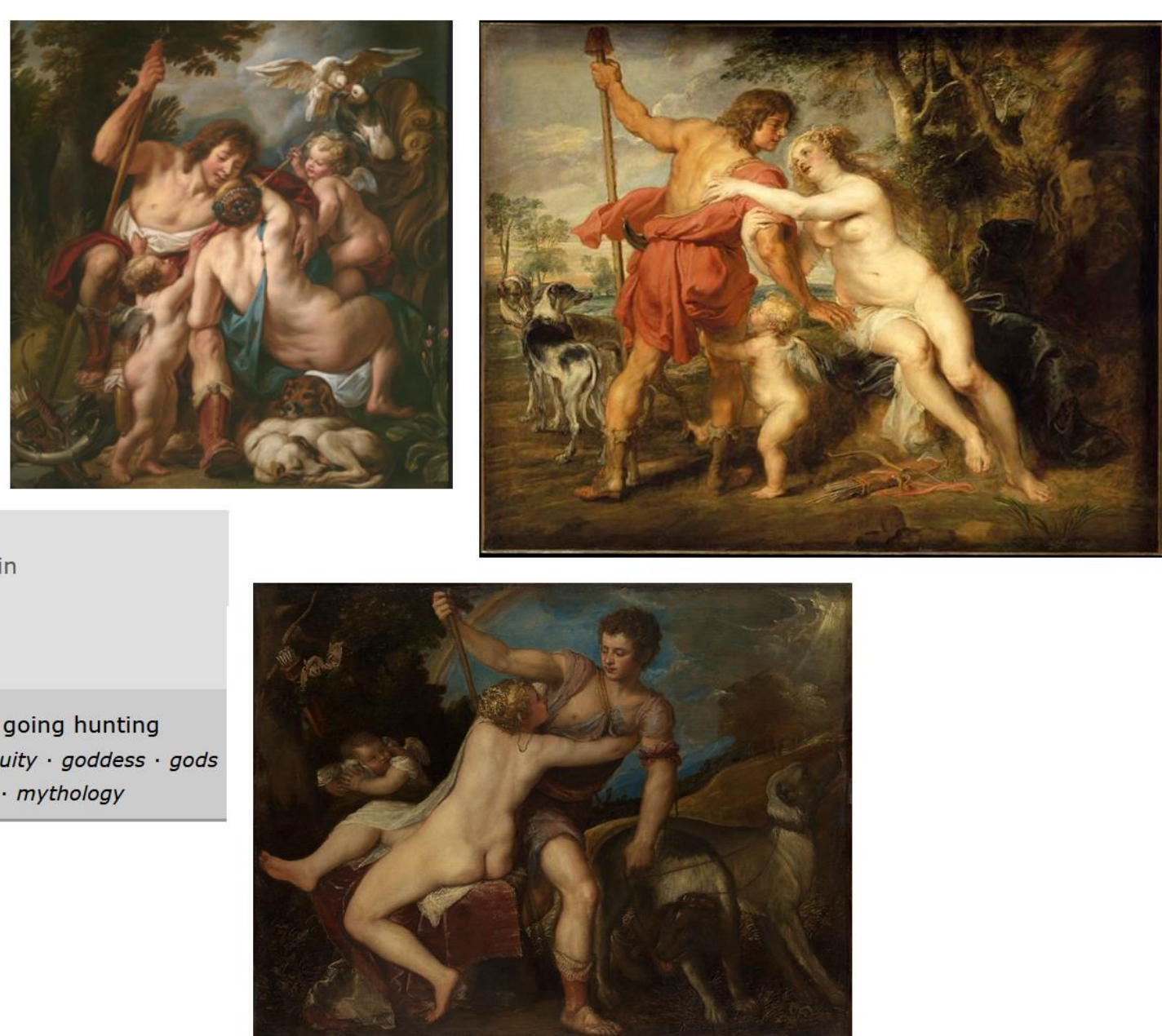
Many consumers of the RMFAB collections perform **queries on iconographic themes**.

In the collection database objects are assigned **iconographic metadata** for a richer user experience. These **annotations are added manually** which is **time-consuming** and **subjective** for the annotator and leads to **low data quality** for the data consumer.

### Iconclass

Outline · Edits · Clipboard

- 0 Abstract, Non-representational Art
- 1 Religion and Magic
- 2 Nature
- 3 Human Being, Man in General
- 4 Society, Civilization, Culture
- 5 Abstract Ideas and Concepts
- 6 History
- 7 Bible
- 8 Literature
- 9 Classical Mythology and Ancient History
- 90 gods = classical mythology
- 90c the great goddesses of Heaven, and their train
- 90ca (story of) Venus (Aphrodite)
- 90ca1 love-affairs of Venus
- 90ca2 Venus and Adonis as lovers
- 90ca31 Venus trying to prevent Adonis from going hunting
- Adonis · Venus · ancient history · classical antiquity · goddess · gods · heaven · history · hunting · love-affair · lover · mythology



## HENSOR goals: annotation - publication - querying

(i) AI tools for automatic annotations

- **Automatic detection and annotation of saints in paintings** to speed up the manual work process of the registrars.
- Not only descriptive, also **the actual subject** of what is depicted. This is determined by analyzing the **spatial relationships** to arrive at the intended meaning.

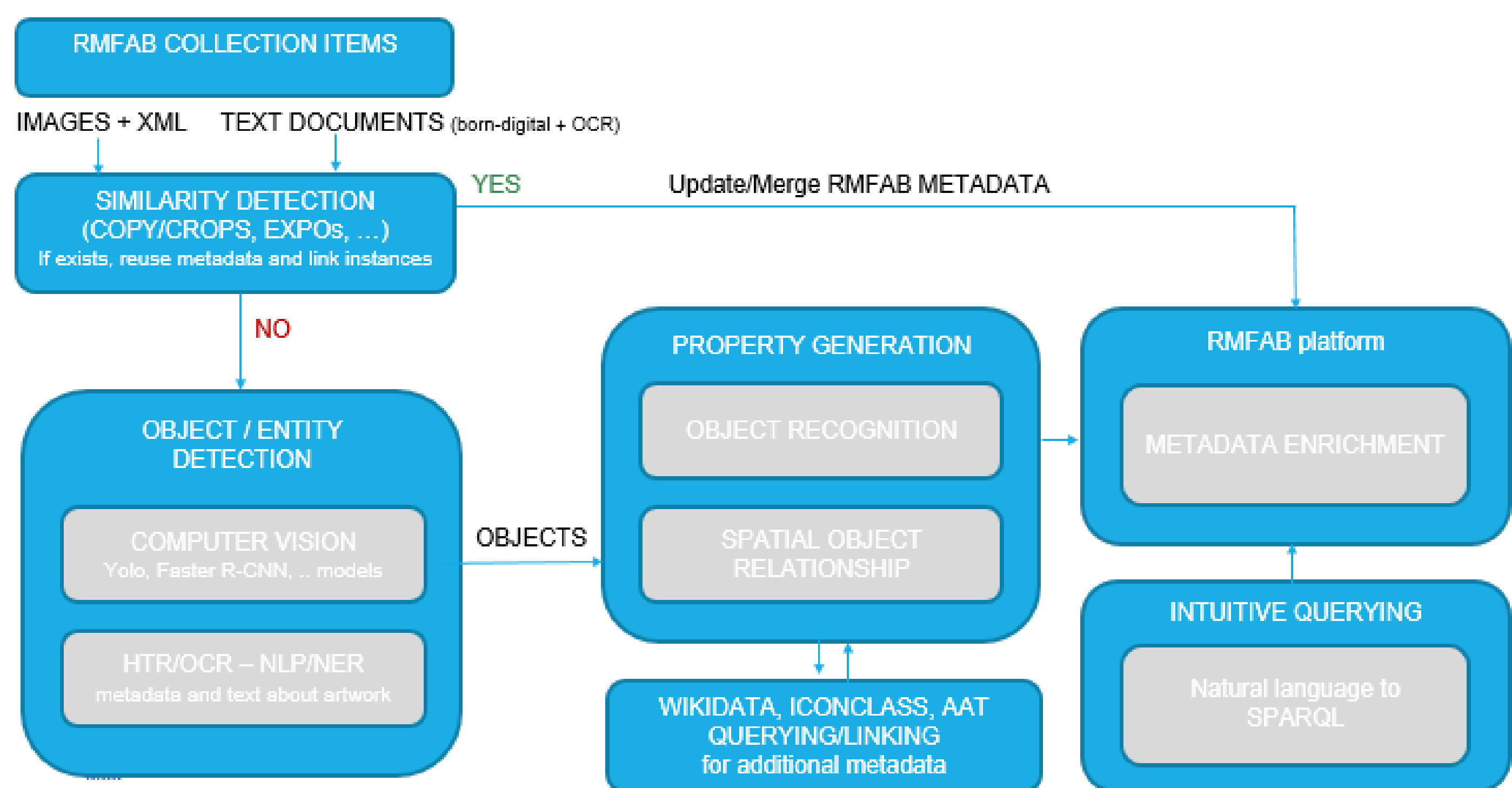
(ii) Cross-collection linking with Semantic Web technologies

- Annotations using **standardized** metadata standards (Iconclass, IIF)
- Use of standards enables **cross-collection linking**
- Collection data in a FAIR **Wikidata** endpoint with global reach

(iii) Intuitive querying

- Multiple query **interfaces**, e.g. **natural language** queries
- **Federated** querying across FSI and beyond

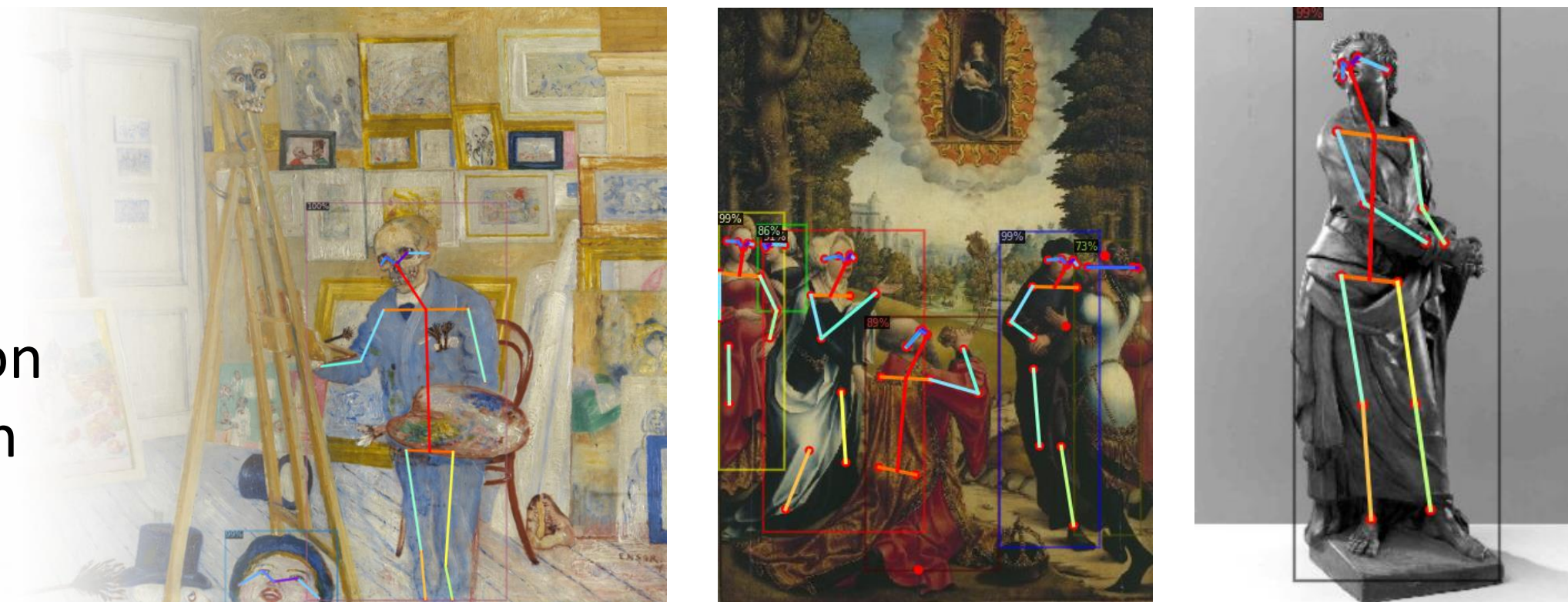
## Architecture: end-to-end annotation and publication



## Building blocks from computer vision

(i) Object status

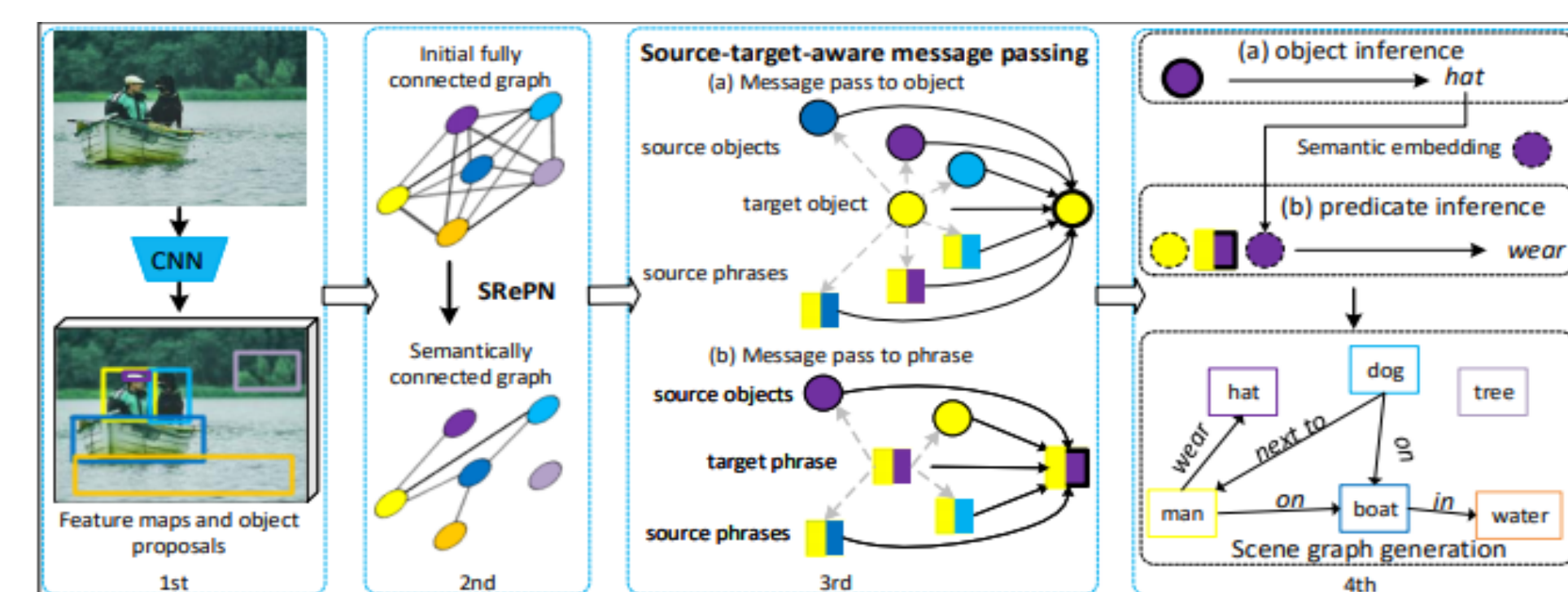
- Facial expression
- Pose estimation



From estimation to Iconclass mapping: classification (e.g. praying), similarity metrics, event recognition based on pose (e.g. mass), pose-based object relationships

(ii) Spatial relations

- Scene graphs



Semantic and structural description of an image, denoting the objects with nodes and their relationships with edges

## FAIR data publication and querying using Wikibase

### Wikibase

- F**, **I** Linked Open Data: RDF, SPARQL, IIF,...
- A** Controlled Access
- R** RMFAB copyright policies

**Operational:** automated pipelines, ETL, quality assurance,...

### End-User interface

Natural Language → (federated) SPARQL



E.g.: "All paintings with a woman holding a baby"



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