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## Automatic reconstruction of the genealogy of plots and buildings from historical sources

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## CONTEXT

- **Fast and consistent progress brought about by deep neural networks** in the field of extracting information from unstructured historical sources.
- The aim of the French National Mapping Agency (IGN) to complete its databases with information such as building construction dates.

## MOTIVATIONS

The Napoleonic cadastre is the **first French land registry**, dating from the early 19th century to the mid-20th century. It is rich in **information on land use/cover evolution** provided for the whole territory before the generalization of aerial photography. It is complex to exploit due to its large corpus size, its nature and its content.

The targeted IGN application and the chosen archival sources lead to the following objectives:

- Propose an **automated processing pipeline to extract information from archival documents**.
- Structure the extracted data into a **geo-historical knowledge graph**.

## THE NAPOLEONIC CADASTRE

Two main types of documents : **maps** and **registers**.

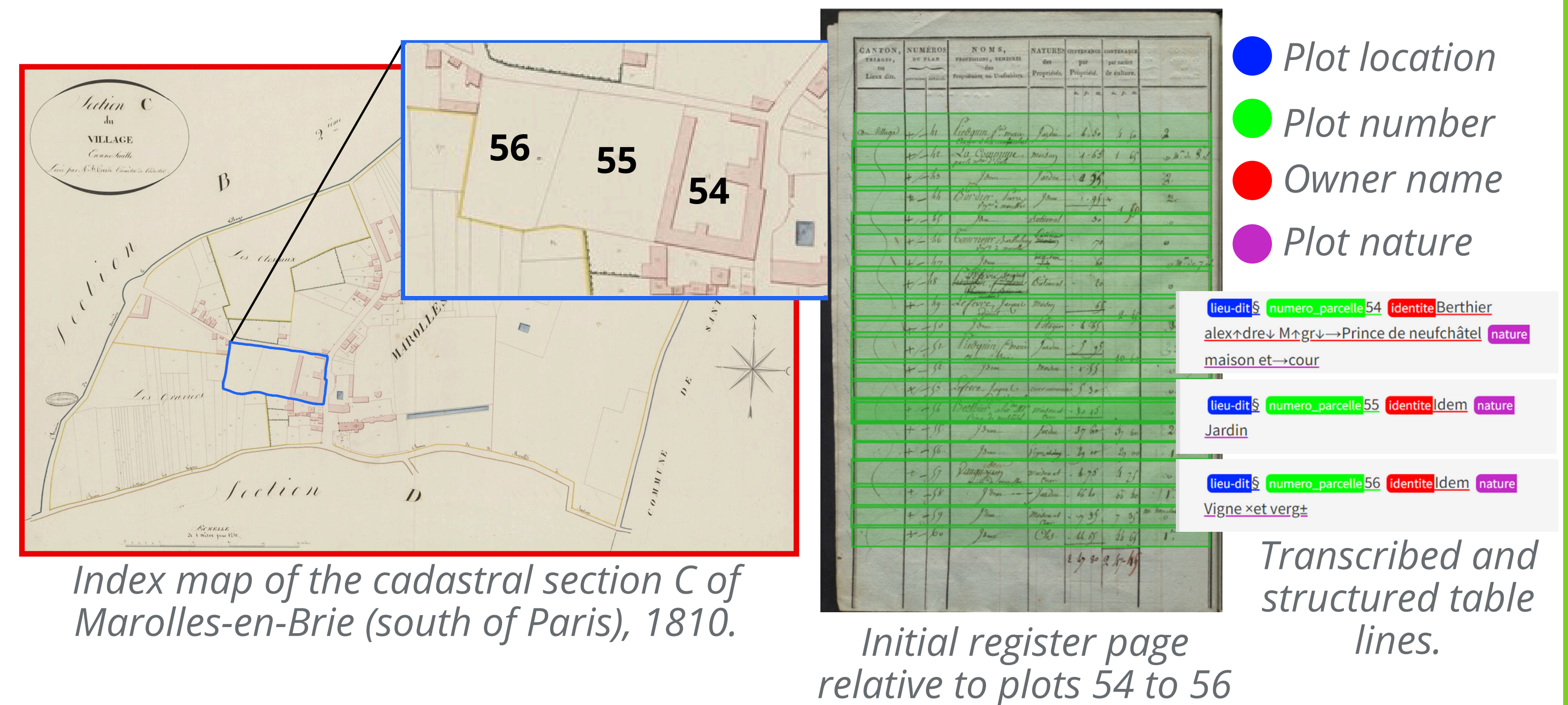
**Maps** include :

- **Cadastral index maps** represent the built and unbuilt properties
- The **assembly map** of the cadastral index maps shows the area represented by each index maps sheets of a given commune.

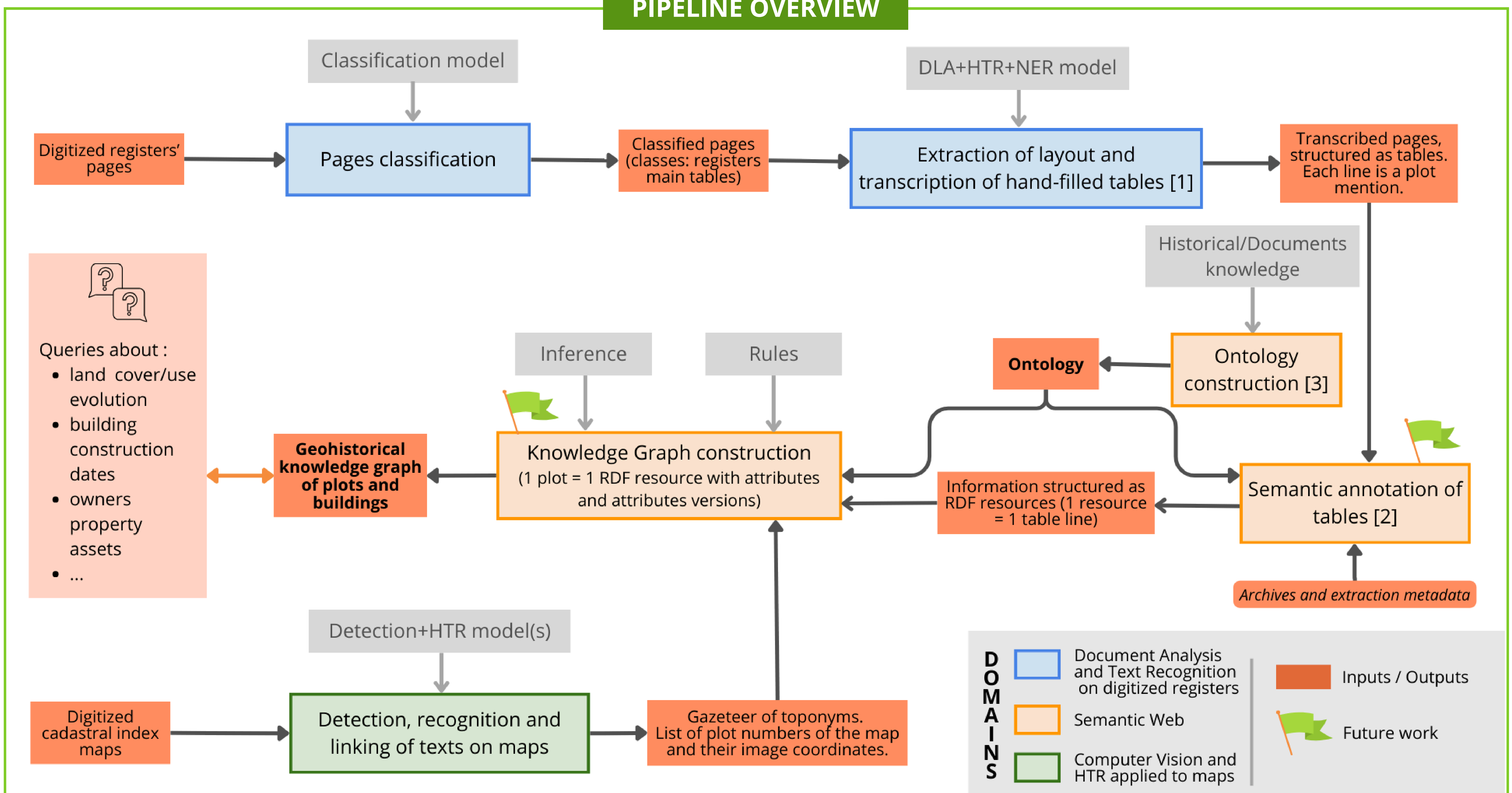
Maps were not updated until a new cadastre was initiated (several decades separate one version from another).

**Registers** include :

- **Initial registers** filled at the same time of the maps production and are considered as its legend. Gives first owner name, nature and initial taxes amount for each plot. They should not have been updated after creation.
- **Mutation registers** : created at the same time of the initial register. Updated each time a change happened to a plot.



## PIPELINE OVERVIEW



## TAKEAWAYS

- The proposed method consists of an **end-to-end pipeline to extract, structure and retrieve information contained in archival documents**.
- The annotation model designed for the extraction and transcription model is fully compatible with **semantic annotation of tables tasks**.
- The table annotation tasks are performed to create RDF resources for each plot mention extracted from the registers.
- After being linked and reordered, the resulting RDF resources can be used to create a geohistorical knowledge graph that allows us to follow the evolution of the plots in terms of each of their attributes (owner, nature, etc.).

## ACKNOWLEDGEMENT

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Digitized documents are provided by the Archives of the French department of Val-de-Marne (AD94)

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- [1] Coquenot et al, IEEE TPAMI 2023  
 [2] Liu et al, Journal of Web Semantics 2023  
 [3] Bernard et al, GAST 2024



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