Municipality of Padua

Internships Offers

Contact information: alessandro.sperduti@unipd.it

PROJECT N. 1

Scope : Use of generative AI in the context of citizen access to services

Timing : 6 months starting from April 2024

Project description

How many times have we found ourselves faced with a Public Administration website that is difficult to navigate and for which we are unable to understand the logic with which to find the right service that meets our needs? We have all certainly noticed the distance between the language of Public Administration and that of citizens.

The project aims to create, with the use of generative Artificial Intelligence, a specialized mediator who guides citizens in the use of both information services (informed citizen) and interactive services (active citizen) provided by a Municipality such as that of Padua

The first phase of the project will consist in the creation of a system capable of supporting semantic search scenarios on various types of content (structured data and textual documents), contents which in this first solution will be previously indexed using the company 's own semantic "embedding" features of LLM models.
A first objective will be to identify the knowledge base (and therefore the use case) which has the characteristics of content format, number of typologies and number of instances per typology suitable for the use of the tools currently available for text understanding , semantic indexing, semantic search and text generation.
The user's requests will be expressed in natural language, and the system will use its linguistic skills to:

- extract from the context of the individual request (request message, and possibly profile elements or additional indications generated by the system) the elements that can best characterize and specify the semantics of the question;
- return the results of the research in natural language (synthesizing them, or integrating them, or reporting the most significant ones).

In the next phase we plan to extend the system's skills, to make it capable of:

- provide active support in the role of assistant, with research paths that develop interactively, in a conversational context;
- integrate into the system the ability to use external data sources (rest endpoints , databases, real-time update services) to improve, where the system identifies the need or opportunity, the information content of the answers provided to the user.

Specific activities of the internship

The participants in the internship will be included in the first phase of a structured project, which in subsequent developments, aims to the creation of complete virtual assistant functions, with target (in their respective areas of interest) at both citizens and public administration operators.
In this initial phase, the proposed activities will focus on the creation of semantic search services which, with interactive methods based on simple queries in natural language (for now without full support of a conversational context), are able to facilitate exploration and search operations. in some domains representative of the information, documentary and procedural skills assets that the public administration holds.

In this context, also taking into account the inclinations and specific skills of the participants, the tasks entrusted may include:

- acquisition and indexing of heterogeneous data, coming from different sources, with import in vector and semantically qualified form;
- assessment of the semantic database solutions, as well as the available linguistic models (with particular regard to the open source world and the Italian language), and the related parameterizations, to evaluate their effectiveness for the purposes of indexing the contents, interpreting the queries and of the synthesis and return of the results;
- evaluation of possible solutions for the recognition of specific areas of research and interest declared or implicitly expressed by the user;
- contributions to the development, configuration and deployment activities of application components.

PROJECT N. 2

Scope : Analytics in the context of city mobility

Timing : 6 months starting from April/May 2024

Project description

The smart city is characterized by intelligent management of services and places through the use of technologies that improve the quality of life and well-being of people.

Mobility is certainly one of the most important aspects of living in a city, it affects our working day and otherwise, because good mobility allows us to reduce the level of pollution and does not make us waste time that we could instead dedicate to our interests.

The project aims, on the basis of the data collected by numerous sensors distributed in the city, from the databases of mobility ordinances, from data relating to weather conditions, accidents, ongoing road works and many others, to create analytics in the following domains:

- Accidents
- Vehicle traffic models
- Soft mobility flow models

Specific activities of the internship

In this context, also taking into account the inclinations and specific skills of the participants, the tasks entrusted to the interns may include:

- Detection and formalization of information needs to support decisions
- Definition of analytics
- Assessment of the necessary data sources
- Insertion of data sources into the Data Catalog
- Analytics development
- Development of predictive simulation models

PROJECT N. 3

Scope : Analytics in the environmental field

Timing : 6 months starting from April/May 2024

Project description

The smart city is characterized by intelligent management of services and places through the use of technologies that improve the quality of life and well-being of people.

The problem of global warming and energy consumption in cities also manifests itself with the creation of critical environmental situations that put health at risk and trigger the acceleration of city warming. Climate heat waves associated with urbanization that does not mitigate these conditions can generate real heat bubbles in some areas of the city. These manifest themselves with heat islands that can reach up to 4-5 degrees higher than other parts of the city.

The project aims, on the basis of the data collected by numerous sensors distributed in the city, from cartographic and cadastral databases and from artificial satellites, to create analytics which allow us to support urban regeneration processes aimed at combating urban heating.

Specific activities of the internship

In this context, also taking into account the inclinations and specific skills of the participants, the tasks entrusted to the interns may include:

- Detection and formalization of information needs to support decisions
- Definition of analytics
- Assessment of the necessary data sources
- Insertion of data sources into the Data Catalog
- Analytics development
- Development of predictive simulation models

PROJECT N. 4

Scope : Analytics in the field of real estate

Timing : 6 months starting from April/May 2024

Project description

All of us walking the streets of our city have certainly noticed the large number of unused properties, both residential and commercial. We have all traveled and we have certainly realised, looking at the city maps of booking portals, how many private properties are used for tourist hospitality. On the

contrary, off-site students experience the difficulty of finding and maintaining quality accommodation at a sustainable cost.

The objective of the project is the development of analytics in the area described above in the context of the City of Padua. The aim is to support the municipal administration in the definition of incentive tools for the making available of unused properties or, where the competence of property management is regional or national, to support a political action to raise awareness for an adequate regulatory intervention to overcome this criticality.

Multiple data sets will be available (population distribution, business location, tourist presences, property register, rental contracts, ...), appropriately purified of personal information and therefore usable for the development of analytics .

Project activities

In this context, also taking into account the inclinations and specific skills of the participants, the tasks entrusted to the interns may include:

- Detection and formalization of information needs to support decisions
- Definition of analytics
- Assessment of the necessary data sources
- Insertion of data sources into the Data Catalog
- Analytics development
- Development of predictive simulation models

By way of example, an output could be the creation of dashboards (even with a cartographic component) to analyze the qualitative situation and the degree of use of the real estate assets of the municipal area of Padua.