

# Lifelog Moment Retrieval Web Application

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## 1. Introduction

Lifelogging is the process of tracking and recording personal data created through our activities and behaviour [1], consisting of a unified digital record of the totality of an individual's experiences, captured multimodally through digital sensors and stored permanently as a personal multimedia archive. The work presented in this poster proposes a lifelog web application designed and developed for the participation in the ImageCLEF lifelog task [2], more specifically in the Lifelog Moment Retrieval (LMRT) sub-task. This web application was developed in order to visualize and provide an interactive tool to the lifelogger. The application is divided into three blocks, namely upload, retrieval and visualization. Each block provides interaction with the lifelogger.

## 2. Web Application

A first version of a web application was developed in order to visualize and provide an interactive tool for lifelogger. This web application was divided into three main modules, such as upload, retrieval and visualization blocks, which provide interaction with the user in each one. In Figure 1 is presented a general representation of the web application.

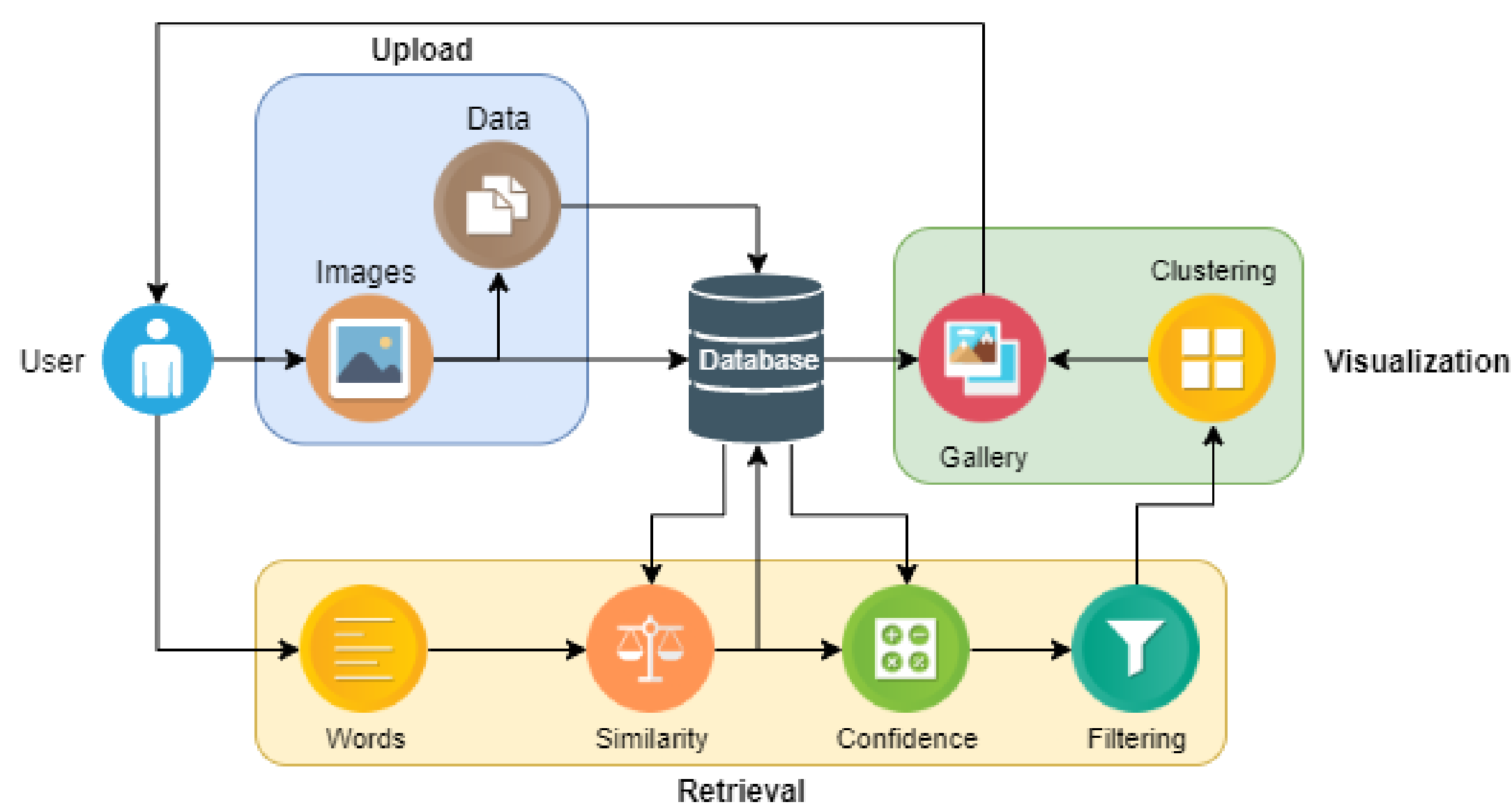


Fig. 1 - General representation of the developed application. The lifelogger interacts with the three blocks: Upload, Retrieval and Visualization.

### Upload

The data is organized in the application database into different tables/models, such as images, concepts, locations, activities, scenes, attributes, among others. Each model maps to a single database table. The relationship between models makes our system faster and more efficient. The image model has a many-to-many relationship with the other models. For example: an image can contain several concepts, and a concept can be found in several images.

### Retrieval

In this application, the lifelogger retrieves a specific moment from his personal lifelogs by introducing relevant words divided into several categories, such as objects, locations, activities and irrelevant words. Figure 2 shows the retrieval view of the web application. In the retrieval block, the input arguments are: objects that appear on the images; activities that the user was practicing; locations or places where the user was; negatives or irrelevant things, activities or locations that should not appear in the images; time ranges, years and days of the week (Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday). The confidence of the selected images is computed using the cosine similarity of word vectors and the score of the labels. As a last filter on the retrieval block, the images are selected based on the confidence threshold, which can be adjusted by the user.

### Visualization

The selected images are organized into different clusters based on images timestamps. The application provides an easy way for users to visualize and identify the clusters that are associated to the specific topic. Figures 3 and 4 show the user views of the clustered images in the form of images gallery and data tables, respectively.

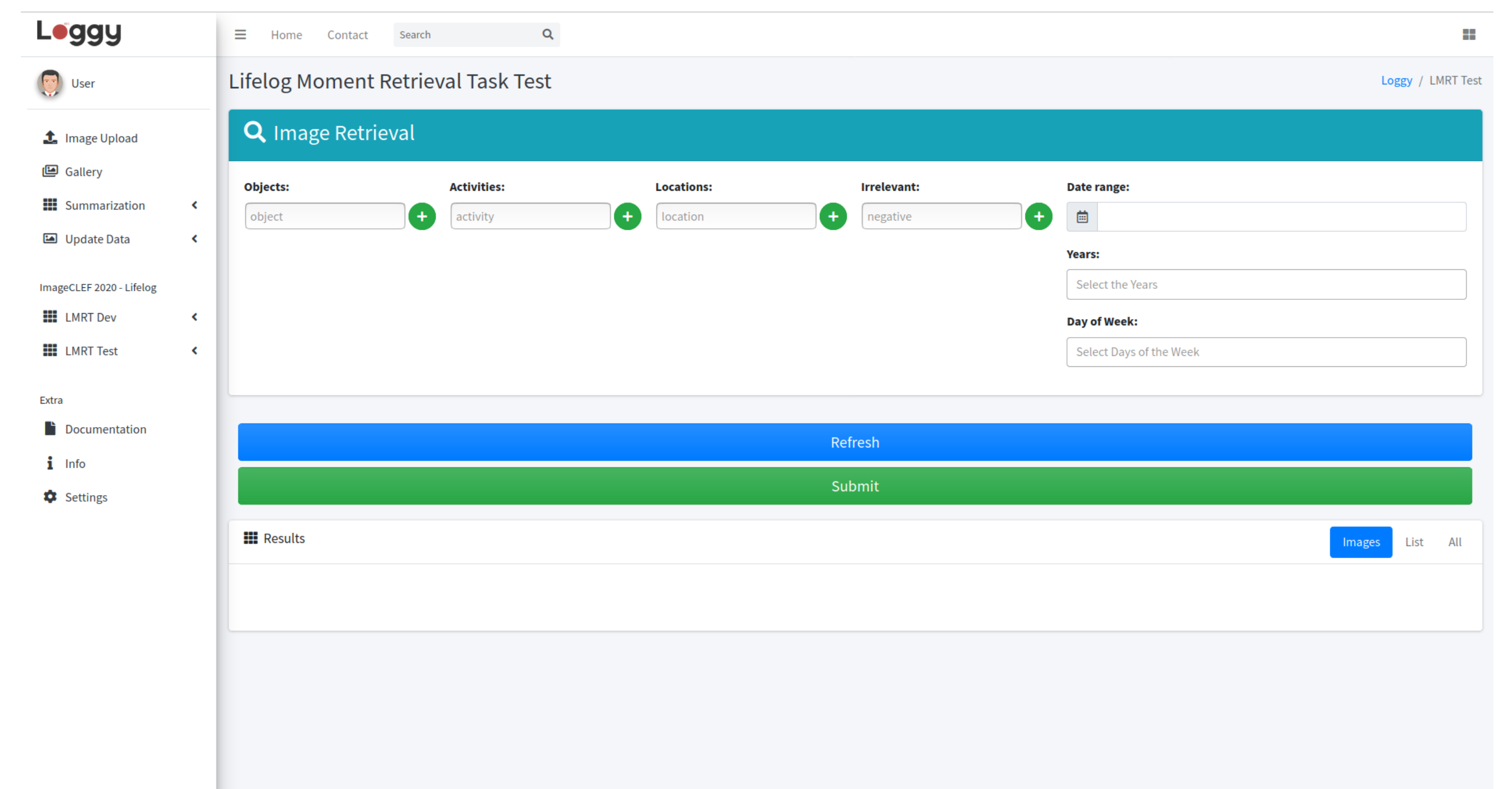


Fig. 2 - Web application retrieval view.

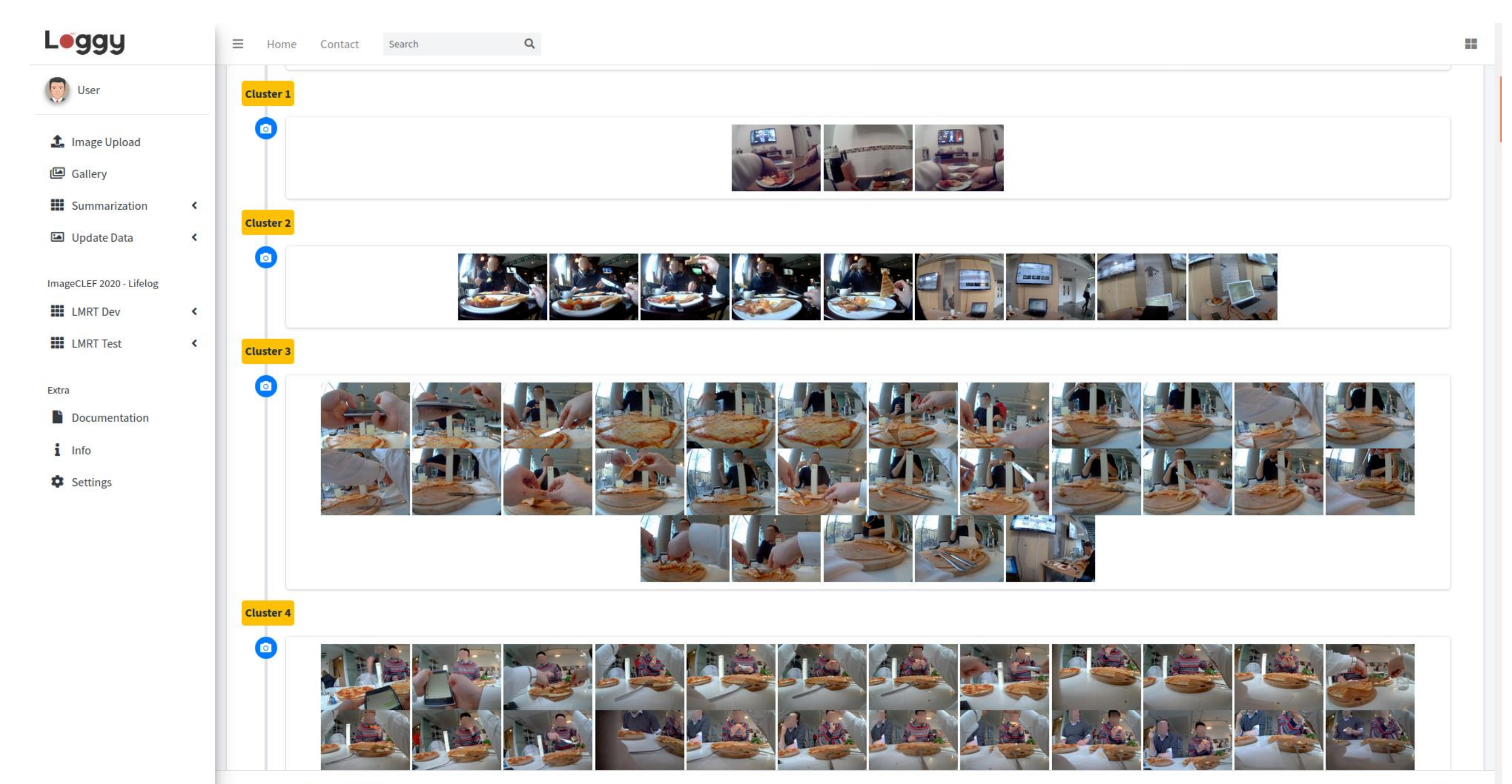


Fig. 3 - User view of the image clusters in form of image galleries.

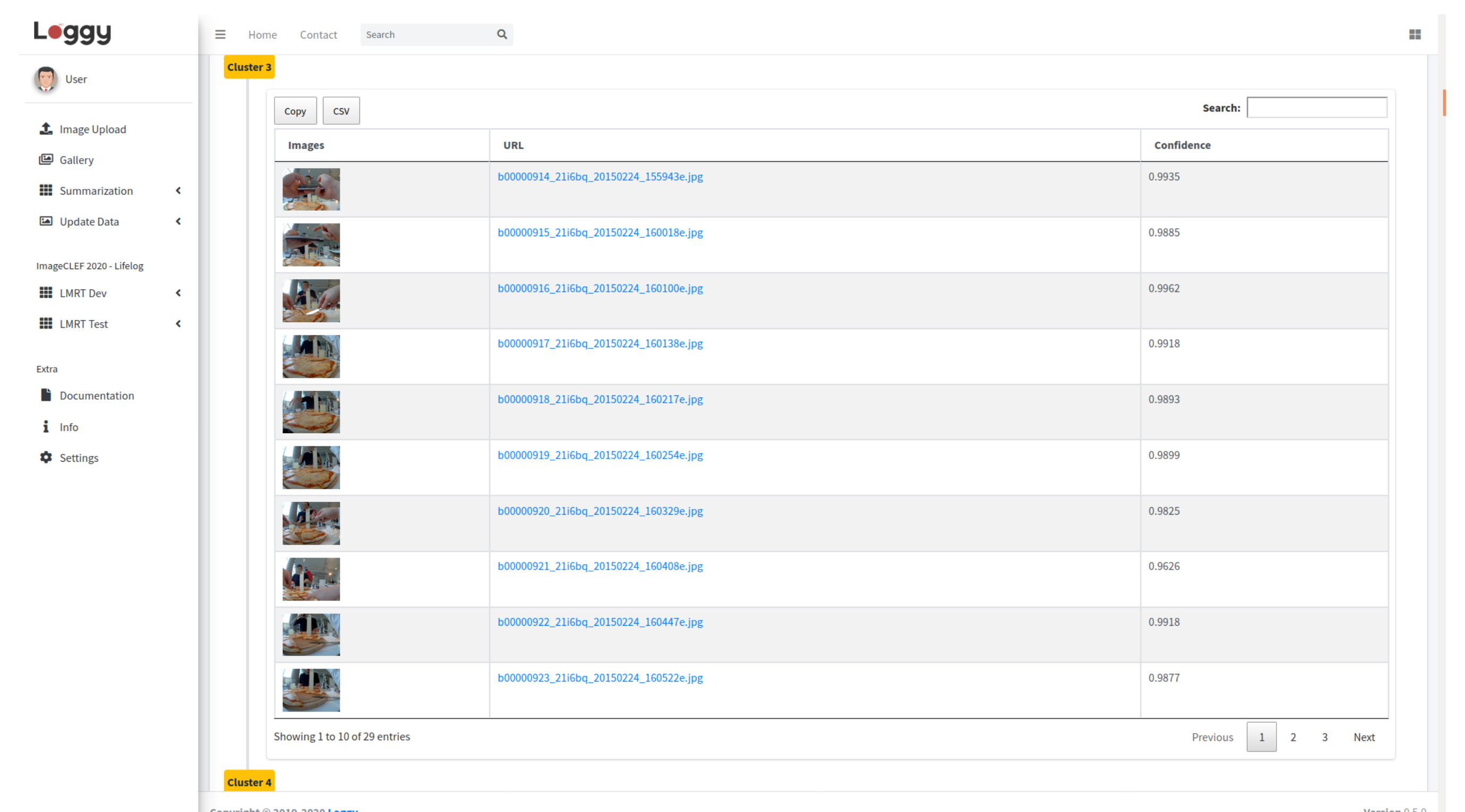


Fig. 4 - Web application retrieval view.

## 3. Conclusion and Further Work

The work presented in this poster proposes a lifelog application that aims to help people to improve their quality of life providing a memory enhancement tool. The experimental results obtained in the 2020 ImageCLEF lifelog task were promising leading to the conclusion that an approach with visualization and user interaction is a suitable method for a lifelog application. As a future work it is pretended to implement better scene recognition, object detection, activity and color detection algorithms for the new version of the application since a richer description of the images result in an increase of the performance in the retrieval task.

## 4. References

- [1] R. Ribeiro, A. J. Neves, and J. L. Oliveira, "Ua.pt bioinformatics at imageclef 2019: Lifelog moment retrieval based on image annotation and natural language processing." in CLEF (Working Notes), 2019.
- [2] R. Ribeiro, J. Silva, A. Trifan, A. J. Neves, and J. L. Oliveira, "Ua.pt bioinformatics at imageclef 2020: Lifelog moment retrieval web based tool." in CLEF (Working Notes), 2020.

## 5. Acknowledgements

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