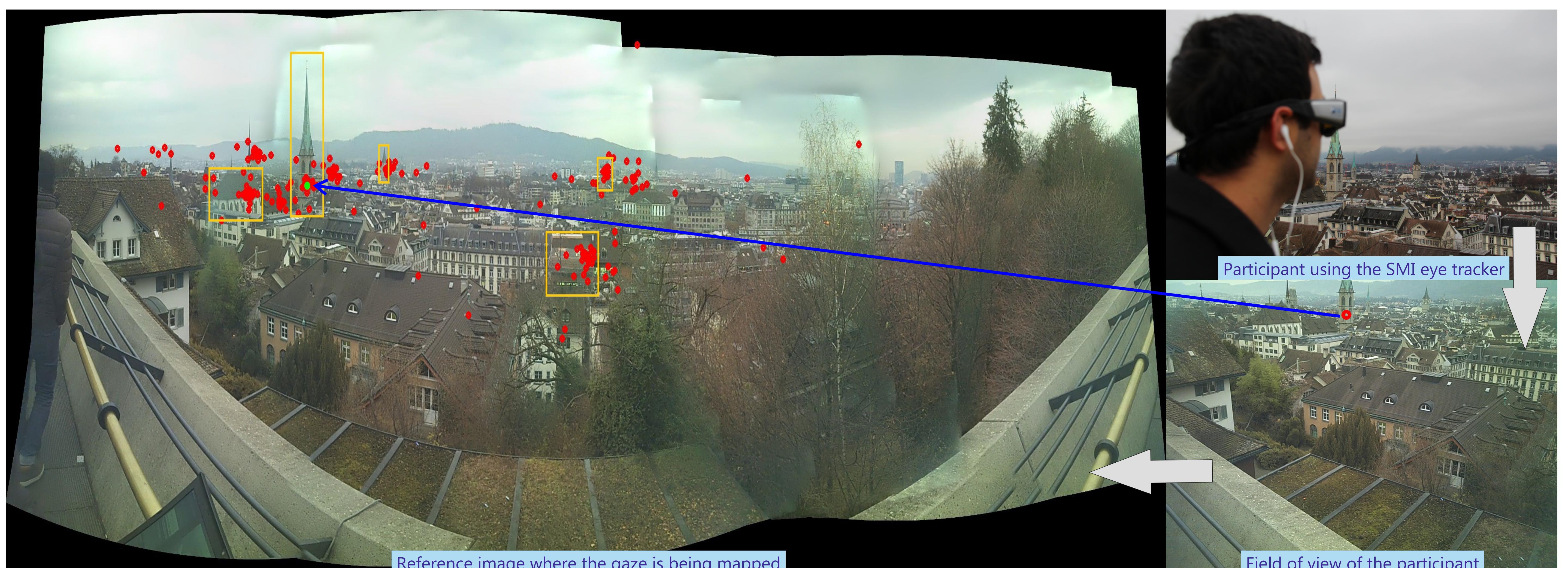


LAMETTA: Location Aware Mobile Eye Tracking for Tourist Assistance

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Gaze-Based Interaction in Urban Spaces

In the past years extensive research has been conducted with regard to gaze estimation and tracking in 3D outdoor spaces. However, using a user's gaze in an intuitive, efficient and privacy-preserving manner to provide location-based services or for determining the user's interests, is still an issue of current research.

For example: how can we design a gaze-based recommender that could notify the observer of a city panorama about buildings that match her interest?

In 2015, the LAMETTA project has been initiated at the Chair of Geoinformation Engineering at ETH Zurich. The objective of this project is to answer the previously mentioned questions. For reaching these objectives, an outdoor gaze-based interaction platform is being developed in the first phase of the project. The platform will be used for interactions studies in later phases of the project.

Challenges

- Estimating the point of regard in real urban environments.
- Leading the tourist's attention to gazable objects.
- Overcoming the Midas touch problem.

Automatic Gaze Mapping

One of the main challenges of gaze-based interaction consists in estimating the object a user is looking at in the real world. Standard software packages of current eye tracking systems do not allow for this. For instance, it is usually not possible to install visual markers in urban environments.

Our approach to solve the estimation of the object of regard consists in mapping the gaze of the user to a reference image for which the objects of interest are known in advance. The mapping is facilitated by the use of features extracted using computer vision. A feature is an area of the image which has distinctive properties. Automatic Gaze Mapping can be achieved by matching the features in the field-of-view image of the eye tracker to those of the reference image.

Outlook

The investigation of gaze-based interaction methods for the assistance of tourists will be performed in both, real and virtual environments.

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