AUSTRIAN INSTITUTE OF TECHNOLOGY
TOMORROW TODAY

VISION-BASED INDOOR LOCALIZATION

OVERVIEW

Localization is still a challenging problem indoors, where satellite and radio based solutions fail or are too inaccurate. We have devised an alternative passive solution which is based on the fact that the environment exhibits unique visual appearance. This allows indoor localization to be cast as a purely visual problem without the need to install additional devices or beacons in the environment.

TECHNOLOGY

A mobile phone is localized in real-time by analyzing the content of an image taken with the phone and by matching it with a previously constructed visual 3D model. The solution consists of two steps:

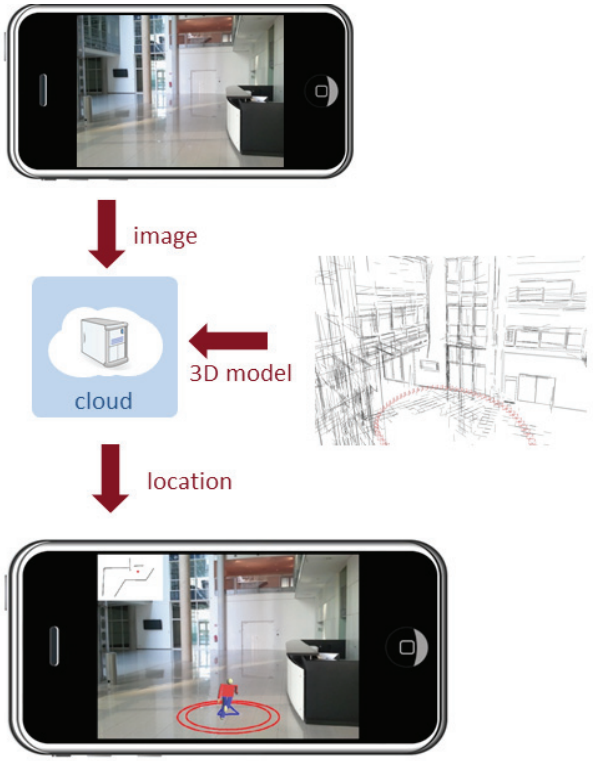
- Creation of a 3D model of the environment (building) by a moving camera in a free walk (offline process)
- Real-time localization is realized by matching a query image with the previously constructed 3D model. To this end, landmarks are automatically detected and selected based on their unique local appearance properties in the acquired images.

In addition to the position, this approach also yields the orientation and viewing angle of the camera.

More information at http://youtu.be/slGF9WjObxE

KEY FEATURES

- Real-time localization via query image
- Position and orientation is determined
- Accuracy down to 1 meter
- Usage in large buildings (tested in train stations and airports)
- Works robustly and accurately, if the query image contains distinctive visual features



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