Project: ARARAT

AUGMENTED REALITY SOLUTIONS FOR ARCHITECTURE, CONSTRUCTION AND INTERIOR DESIGN

INTRODUCTION

Augmented Reality (AR) is a novel visualisation technology where virtual objects are superimposed to the user's view of the real world. By making use of existing natural environments, Augmented Reality offers completely new and flexible ways of visualising and interacting with 3D virtual models and plans.

METHODS AND GOALS

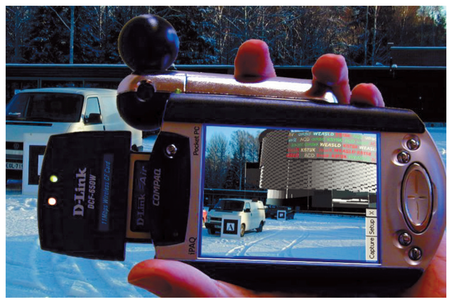
The ARARAT project develops Augmented Reality solutions especially for architecure, construction and interior design. We co-operate with HitLab, Canterbury University (New Zealand) and Osaka University (Japan), using their ARToolKit software for marker detection and tracking.

Instead of marker-based methods, however, our final goal in the project is to use natural features of the world for tracking the user's location. Other ongoing work includes new (gesture-based) interaction methods, multi-user system architectures, as well as photorealistic visualisation. Our work concentrates of four main applications, as explained herein.

AR-INTERIORS

The user takes a series of digital images of the room to be furnished, with a single marker indicating the room's dimensions and perspective. Virtual furniture can be chosen from a menu interface and moved around the room. The furniture stays in place also when scanning through the images one by one.

AR-MOBILE



The user walks in the planned environment, e.g. office to be furnished or outdoors construction site, and views on a mobile device how the place will look like when ready. For mobile devices we employ both PDA (client/server) and tabletPCs (stand-alone), as well as video glasses.

AR-CATALOGUE

The user views a virtual product catalogue using video glasses. Different 3D virtual objects appear out of the catalogue as the user turns the pages, and they may be viewed in stereo from different angles by turning the catalogue. The main use of AR-catalogue is for marketing purposes.

AR-SCALE MODEL

Participants in a meeting view a virtual scale model augmented on the conference table. The virtual model offers various advantages over traditional scale models, e.g. by means of selecting and adding components, enlarging parts, looking inside the model, and exploring with materials and lighting.

PARTNERS

- Tekes (main funding)
- VTT Information Technology (R&D)
- Helsinki City Planning Department (city planning)
- Senaatti Properties (property management)
- NCC Construction Ltd. (construction)
- Lappset Group Oy (playground equipment)
- JKMM Architects Oy (architectural design)
- Adactive Oy (architectural visualisation)
- SenseTrix Oy (virtual reality solutions)
- Efektipiste Oy (3D Internet content)
- DeskArtes Oy (3D CAD software)
- Ides Oy (interior design)

BENEFITS

- Instant visualisation
- Plannning, verification
- Easy to try out alternatives
- Improved communication
- Customer involvement
- Marketing, sales

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