

STUDYING AUGMENTED BUILDING FAÇADES AS MEANS OF UNDERSTANDING URBAN COMMUNICATION

BY THUY LE, COL 2016

MENTOR: DR. ORKAN TELHAN, SCHOOL OF DESIGN, FINE ARTS
FUNDED BY HUMANITIES + URBANISM + DESIGN (H + U + D) INITIATIVE

AUGMENTED REALITY

Augmented reality (AR) is a live, direct or indirect, view of a physical, real-world environment whose elements are augmented by computer-generated sensory input such as sound, video, graphics or GPS data. It is related to a more general concept called mediated reality, in which a view of reality is modified (possibly even diminished rather than augmented) by a computer. As a result, the technology functions by enhancing one's current perception of reality. By contrast, virtual reality replaces the real world with a simulated one. Augmentation is conventionally in real-time and in semantic context with environmental elements, such as sports scores on TV during a match. With the help of advanced AR technology (e.g. adding computer vision and object recognition) the information about the surrounding real world of the user becomes interactive and digitally manipulable. Artificial information about the environment and its objects can be overlaid on the real world. [1]

ENRICHED FACADE

The use of façades as means for communication, can be traced back to the use of windows in Gothic churches. Images illuminated from behind by the sun were used to project many narratives into the interiors of buildings and demonstrated earliest forms of public mediation that utilized building façades. Ever since, embedding media in architecture has moved, rather quickly, from LED screens, LCD displays to new frontiers. [2], [3] Information can now be projected outside buildings through new façade technologies. One of the more recent frontiers in façade design lies in Augmented Reality (AR). AR enabled facades can overlay information onto the built environment and make it accessible to users via their mobile phones.

GOALS

As an attempt to crossbreed digital design and urban studies, this project seeks to create an AR app for mobile devices that allow users to view the computer renderings of the 'virtual history' of targeted building façades in Philadelphia and using data from user interaction to examine how citizens interact with the urban space that surrounds them as well as exploring the possibility of using building facades as a sort of communication channel.

CAMERA/GPS

ACQUISITION

TRACKING

VIRTUAL COMPONENT
RENDERING

DISPLAY

OUTCOMES



FIG 1. Inapp screenshot of 3D graffiti overlaying on Penn Bookstore



FIG 2. Inapp screenshot of 3D City Hall overlaying on Penn Bookstore

A prototype Android application has been developed to display 3D objects such as 3D graffiti or 3D building models as overlays on top of urbanscape through geotagging & tracking.

Another feature under development is the capacity to display 3D overlays on top of image trackers using Qualcomm Vuforia Object Recognition. With this feature, user will be able to create their own image trackers to target 3D objects.

PROSPECTS

There has certainly been underestimation of the learning curve involved in application development and other technology involved. One aspect that could definitely benefit from further study and iterations is the recognition mechanism. Should the recognition process be improved from only recognizing 2D images to 3D objects and eventually intricate building facades, it would be possible to fully realize the initial goals as well as expand it to other applications such as displaying 3D rendering of architectural interventions on top of existing conditions with exact mapping.

Instead of merely being a projection application, the project could be gamified and involve more interactive ways to engage with users to be able to inform them about the city or to 're-imagine' their urban landscape, and even to campaign for social changes (e.g. politicized virtual graffiti or street arts).

REFERENCE:

- [1] FURHT, BORCKO. *HANDBOOK OF AUGMENTED REALITY*. NEW YORK: SPRINGER, c2011.
- [2] AURIGI, ALESSANDRO & FIORELLA DE CINDIO. *AUGMENTED URBAN SPACES: ARTICULATING THE PHYSICAL AND ELECTRONIC CITY*. ALDERSHOT, ENGLAND; BURLINGTON, VT: ASHGATE, c2008.
- [3] BULLIVANT, LUCY. *4DSOCIAL: INTERACTIVE DESIGN ENVIRONMENTS*. LONDON: WILEY-ACADEMY, 2007.

CONTACT:

THUY LE, COLLEGE OF ARTS & SCIENCE, UPENN 2016
THUYLE[AT]SAS[DOT]UPENN[DOT]JEDU

