

Pocketpedia: Augmented Reality Information Sharing

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Introduction

Augmented reality (AR) provides the opportunity for users to enhance their perception of the world by overlaying digital datasets onto live video feeds. Until recently the AR experience was confined to bulky sets of equipment which encumbered users rather than assisting them. In the wake of mobile technology advances, however, smartphones such as iPhone have come to provide the necessary hardware for AR in a lightweight and powerful form.

Pocketpedia allows iPhone users to experience geographical annotations as part of a live camera feed or as part of an augmented map. Users may add their own annotations as well as view annotations provided by others. By studying device use through a thoroughly instrumented platform, we aim to learn more about how people can use augmented reality to discover and share information in the world around them.

Technical Considerations



Location Availability. On-board device GPS and magnetometer data can be highly unreliable. What can we do to normalize erratic readings and provide a more consistent and accurate user experience?

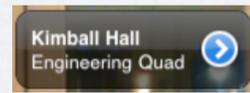
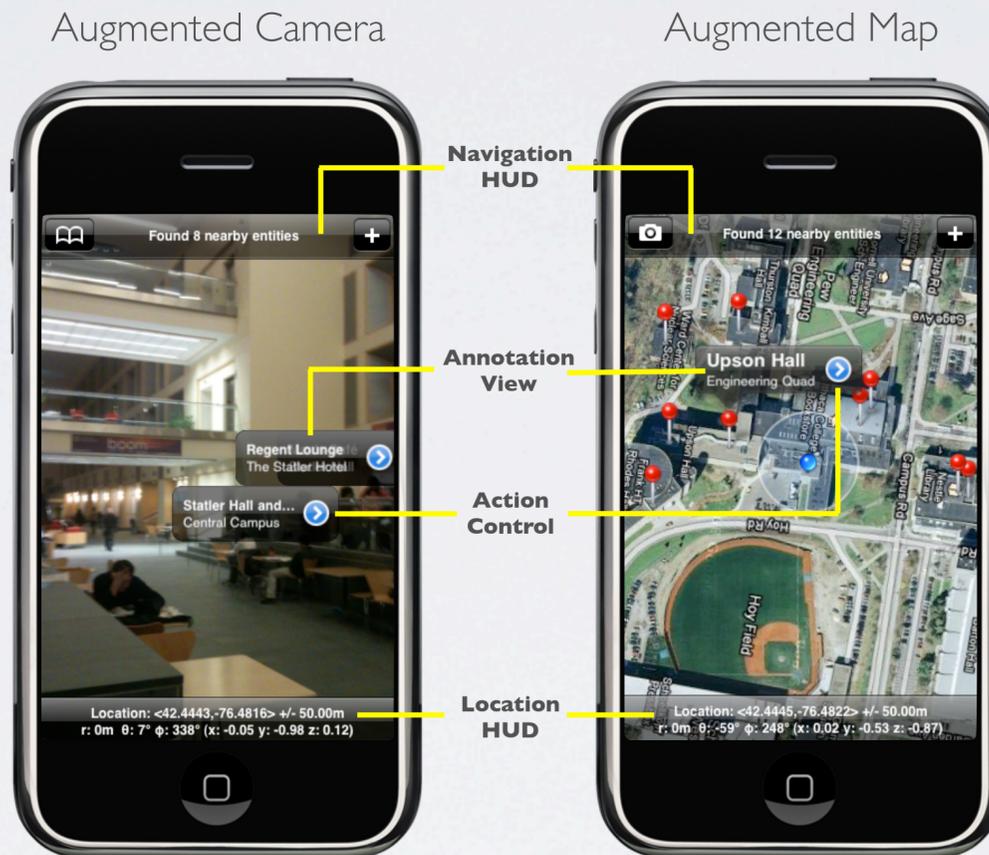


Device Size. Due to the mobile form factor, the AR experience is only as immersive as the user makes it. How can we entice users to use the device to locate information? Furthermore, how can we provide a UI that allows for rapid access to relevant information without cluttering the display?



Entity Action Flexibility. How can we implement a framework that allows for new and creative entity tags to be added? Which kinds of tags would users find helpful and enticing?

User Interface



Consistent Annotations. Map annotation views have been replicated in similar style for the AR camera view. Overlay data is provided on screen in translucent views, lending to the immersive nature of the application.

Navigation by Navigation. Augmented views rotate and pan in response to change in device magnetic heading and position, providing a single, intuitive data navigation system.

Data Service Configuration



Give it a REST. A hosted Representational State Transfer (“REST”) service provides the data backing for the client Pocketpedia application. Connections for data are made asynchronously to provide a responsive user experience.

Push and Pull. Information published to the service by one client trickles down and is disseminated to other connected clients in the same partition.

Entity Actions

Custom XML Schema. Actions are encoded as XML documents which are fetched from the server, then parsed and executed on the client.

Actions? You Name It. Adding new actions is as simple as implementing a callback function. Current actions supported include displaying photos or video clips, text notes, or arbitrary web pages.

Authorized Personnel Only. Actions may reference private URLs. Runtime natively supports HTTP(S) basic as well as Kerberos authentication.

Where's the BOOM?

Pocketpedia employs 3D-to-2D projection algorithms to draw annotations on a live camera feed and utilizes a custom XML schema to perform entity actions. It ties together visual, spatial, and tactile stimuli to respond to user interaction outside of the typical point-and-click interface.

Acknowledgements

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