



Integrating Augmented Reality in the Web

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The Diversity of AR technologies

- AR covers various kinds of technologies
 - Data Overlay / Insertion
 - Head-Mounted Display (HMD)
 - Real-World Interaction
- Different degrees of usage
 - Smartphones AR Browsers: widespread
 - HMD: specialized markets / prototypes
- Hence, different kinds of expectations
 - Not the same maturity level for each of them
- Focus of this presentation: Data overlay / insertion
 - What to do so that these technologies can be more widely used?

Canon Interest

- Canon is an imaging company, and AR requires imaging technologies
 - Capturing, processing, displaying...
- Long-time interest in AR
 - Co-founding of Mixed Reality Systems Lab. (1997)
 - AR through data overlay
 - Recently: Mixed Reality demo
 - E.g. dinosaurs through HMD
 - Application: new product design
 - Prototype-less development
- Interest in W3C work
 - W3C allows full use of the Web
 - Even for companies which are not Web-focused





Barriers to AR Expansion

- AR applications can now reach a broad audience
 - Especially thanks to recent smartphones
- But the lack of standards limits their expansion
 - Platform barrier: AR browsers come as native applications
 - Data barrier: data silos without standard
- The Web as a solution?
 - Web Browser as AR platform?
 - Web data accessible to any application?



Web Browser as AR Platform

- What is needed for an AR platform is
 - Access to “sensors” (camera, GPS, compass...)
 - Ability to control & enrich video (overlay, insertion)
- Most of this is being standardized
 - Capture, Compass, System & Geolocation APIs
 - HTML5 video support (control?) & canvas (enrich)
- Key technologies for enabling Web Browsers as AR platform will soon be made available
 - Yet, need to check that all the pieces can work together
 - Capture API requirements: SHOULD enable displaying of viewfinder
 - This is required for AR (HTML5 video tag?)
 - Responsiveness? Frame rate? Footprint for constrained devices?

The Web and AR Data

- A standard format for AR data would benefit AR applications
 - More freedom for developers, so more innovation, and better user experience (e.g. through mash-ups)
- Which format?
 - KML? ARML? New format?
- Beyond that, the Web is the place to get/put data
 - Ideally, any resource should be a potential AR data
 - Content producers should be able to easily characterize their data regarding AR usage
 - Semantic Web may help to achieve this (RDFa?)
- Solutions may not be as mature as browser ones, but basis for standardization is available



Conclusion

- The Web is a key for AR
 - The Web is the way and the place to find data
- Still, different situations
 - AR platform: browser technology, quite well defined
 - AR data: many scenarios, many actors, more challenging
- First target may be to make the web AR-compatible
 - Web browser as platform, standard AR format
- A challenge to keep in mind: how to enable AR to fully use the power of the Web?
 - Distributed data, semantic web, user-generated content...