Mobile Augmented Reality Using FOSS
Open source AR in the wild

• Stats
  – Google Code: 104
  – SourceForge: 37
  – GitHub: ~75

• Mostly sketches, ARToolkit projects, libs and utilities

• Not seeing many full clients
Mobile Augmented Reality (MAR) Platforms

Android

iOS
Current MAR Native Applications
MAR Web Applications

But we want to do more. How about the accelerometer.
What about access to tilt in the direction of the device?
Watch this.
Kamra

https://research.cc.cc.gatech.edu/polaris/
Barriers to open source

• Walled gardens/silos of AR data
• Fragmentation
  – Android
    • 1.5, 1.6, 2.0, 2.1, 2.2
    • apps vary across carriers
  – Apple
    • iPhone, iPod Touch, iPad
    • iPad video out, determined by application
Client choices

• Evaluated available clients
  – Proprietary: Wikitude, Layar and Junaio
  – Open Source: gamaray and Mixare

• Commonalities
  – XML/JSON formats
  – Points of Interest

• Mixare – Android/java, most mature/active OS MAR project
Choices of Geo Data Servers

- Driven by client requirements
  - Required formats mostly XML or JSON based
  - Only point format supported, think POI (Points of Interest)
- Chose GeoServer
  - Java
  - Familiarity
  - Work for OpenGeo
Geoserver

- Create data output used by Mixare

```json
{ "status": "OK",  "num_results": 1,
  "results": [
    { "id": "2827",
      "lat": "46.43893",
      "lng": "11.21706",
      "elevation": "1737",
      "title": "Penegal",
      "distance": "9.756",
      "has_detail_page": "1",
      "webpage": "http%3A%2F%2Fwww.opengeo.org%2Fpic\n%2Fpicture.png"
  }
}
```
Geoserver

- Almost trivial with Geoserver-archetype-wfsoutputformat
  - Most of data contained in feature
  - Elevation from Geonames service
  - Added distance using a filter to modify response
  - JSON and GeoTools libs available and handy
Mixare

• Compilation
  – Failed on Android 1.6 (HTC Dream)
  – Worked on Android 2.1 (Droid, HTC EVO 4G)
  – Unstable on Android 2.2 – Cyanogen Mod 6.0 (HTC Dream)

• Works for the most part but user experience is not as rich as commercial clients.
Things I would do differently

• Correctly add vendor option, fix filter hack
• Create a WPS process to generate content
  – More flexible
  – Included in GeoServer 2.1 (just released)
• Stretch goal: add markerless tracking to Mixare using Kooaba or other image service
Final Thoughts

- Handset up display clients provide a terrible user experience
- At this time, MAR are mostly toys
- Activity towards an AR format and POI spec. is promising but slow.
- HTML5 client needed
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