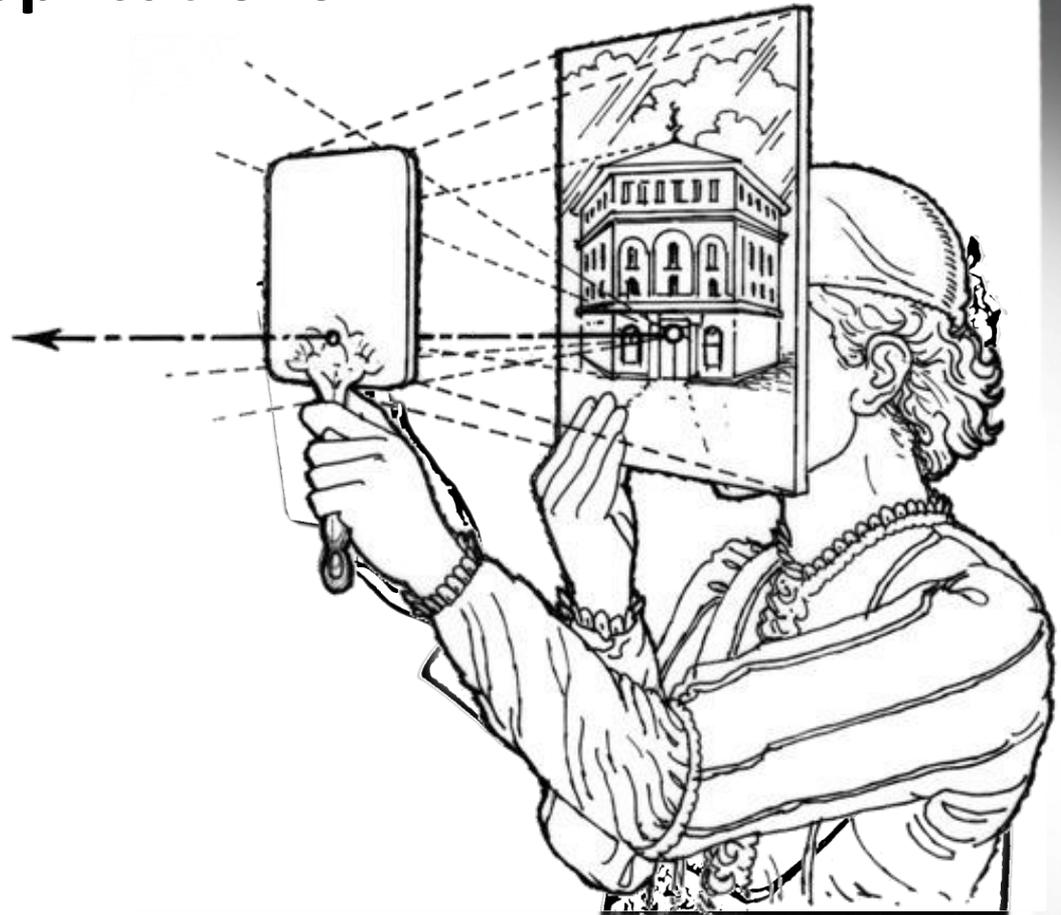


An Augmented Reality Framework for Architectural Applications

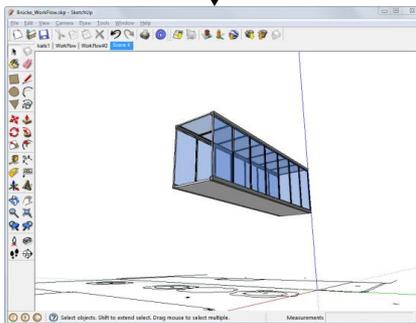


Stefan Niedermair
Peter Ferschin

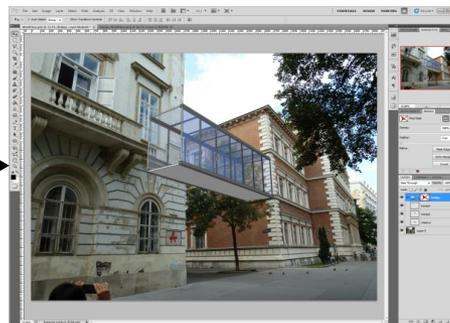
http://maitaly.files.wordpress.com/2011/04/0328p_duomo6_b.jpg

Workflow for Architectural Visualisation

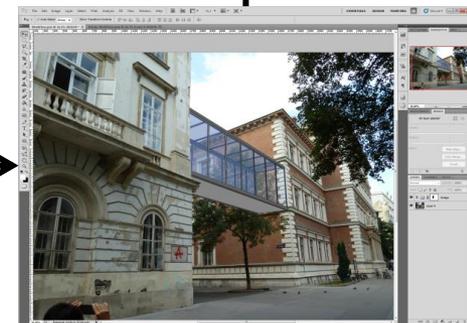
1. Take image



2. Match camera in 3d



3. Overlay image

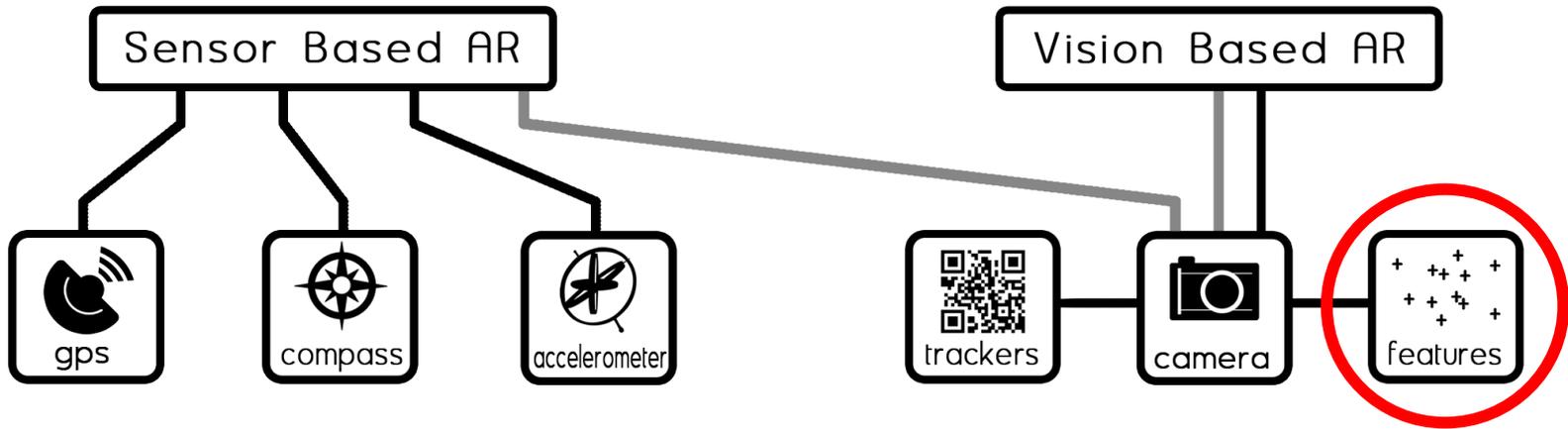


4. Masking out

Architectural On-Site Visualisation

- During design process
 - Evaluate alternatives
 - Influence on neighbours
- Presentation to clients/publicity
 - Sell the project
 - Increase acceptancy
 - Show in context

AR Methods



- + easy to set up
- + universally useable
- low positioning accuracy

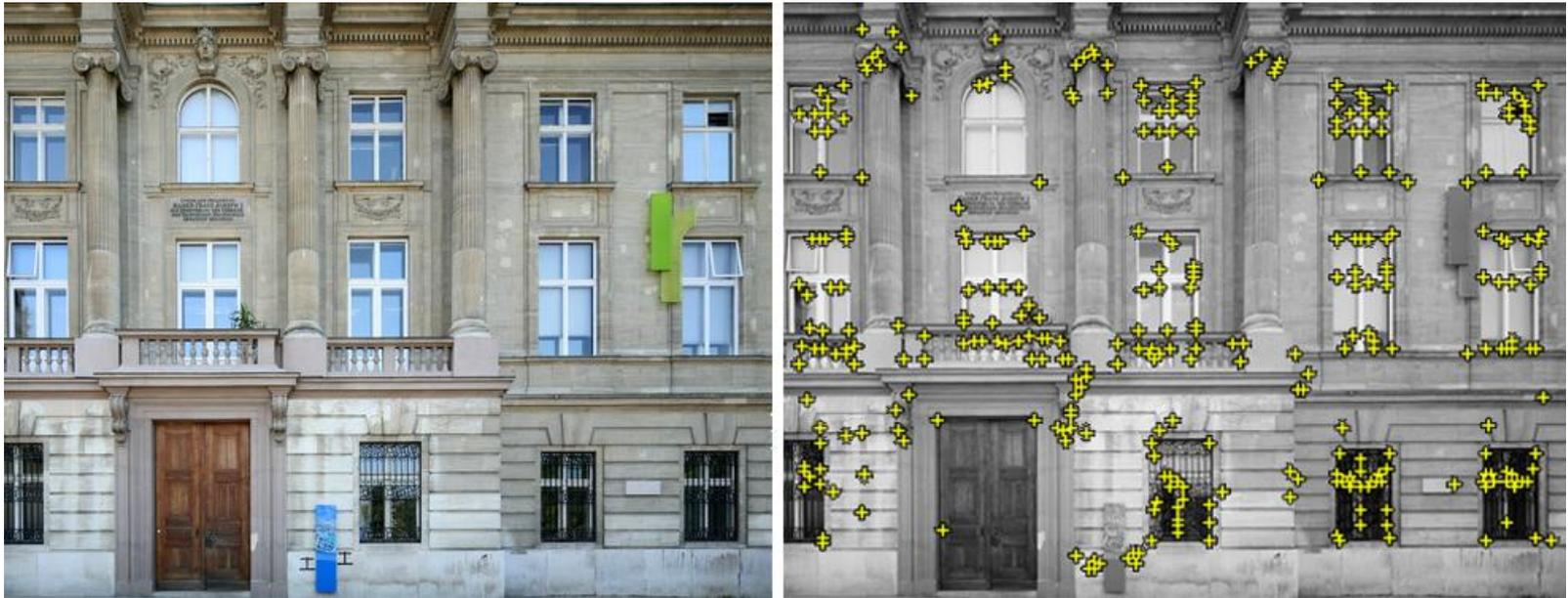
- complex to set up
- + high positioning accuracy
- + ideal for 3d content

Facades for Tracking



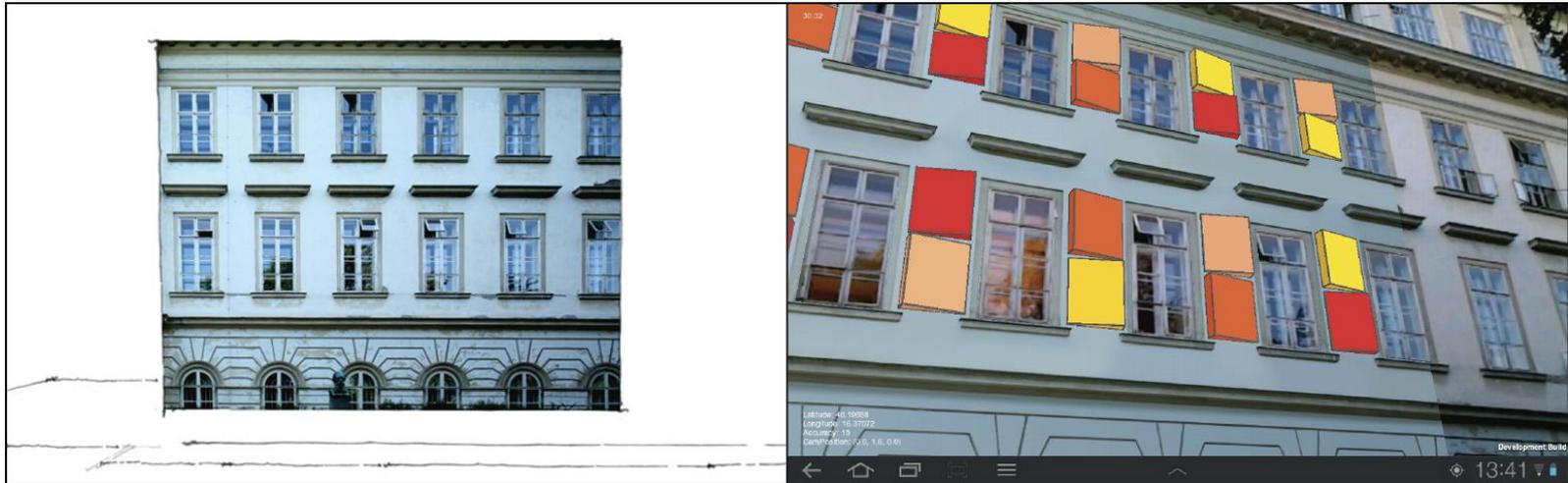
Orthographic facade images were generated using a Tilt-Shift lens

Facades for Tracking



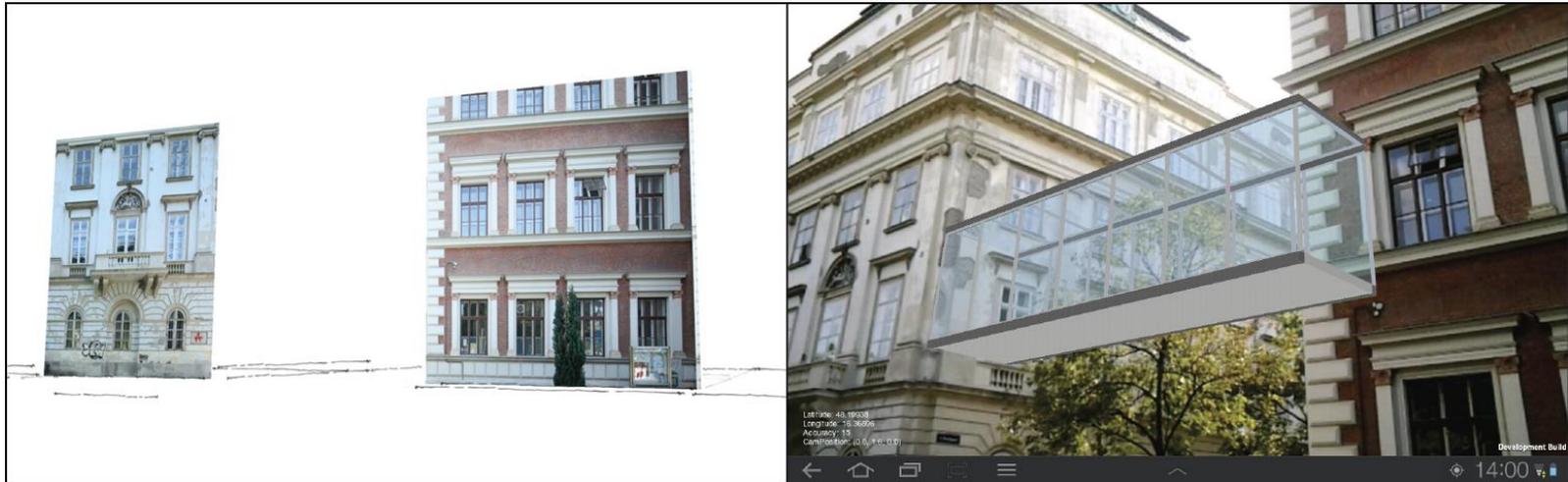
Feature point detection using Qualcomm web service

Single Facade - Overlay



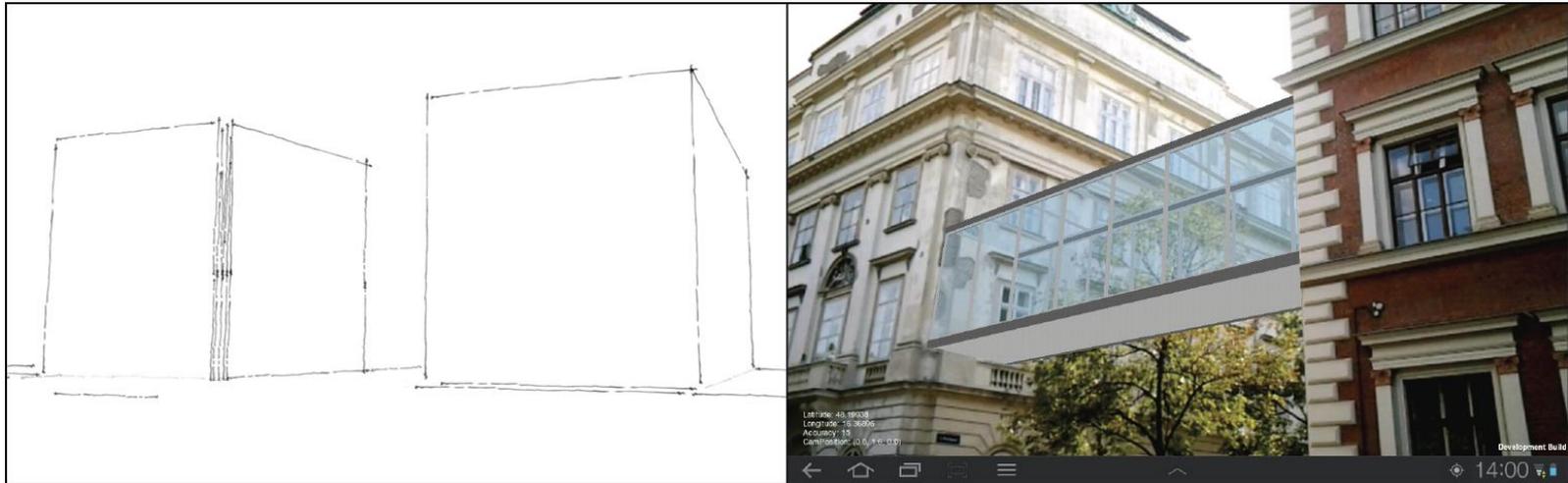
Camera matching to correctly position the 3d geometry

Multiple Facades Positioning



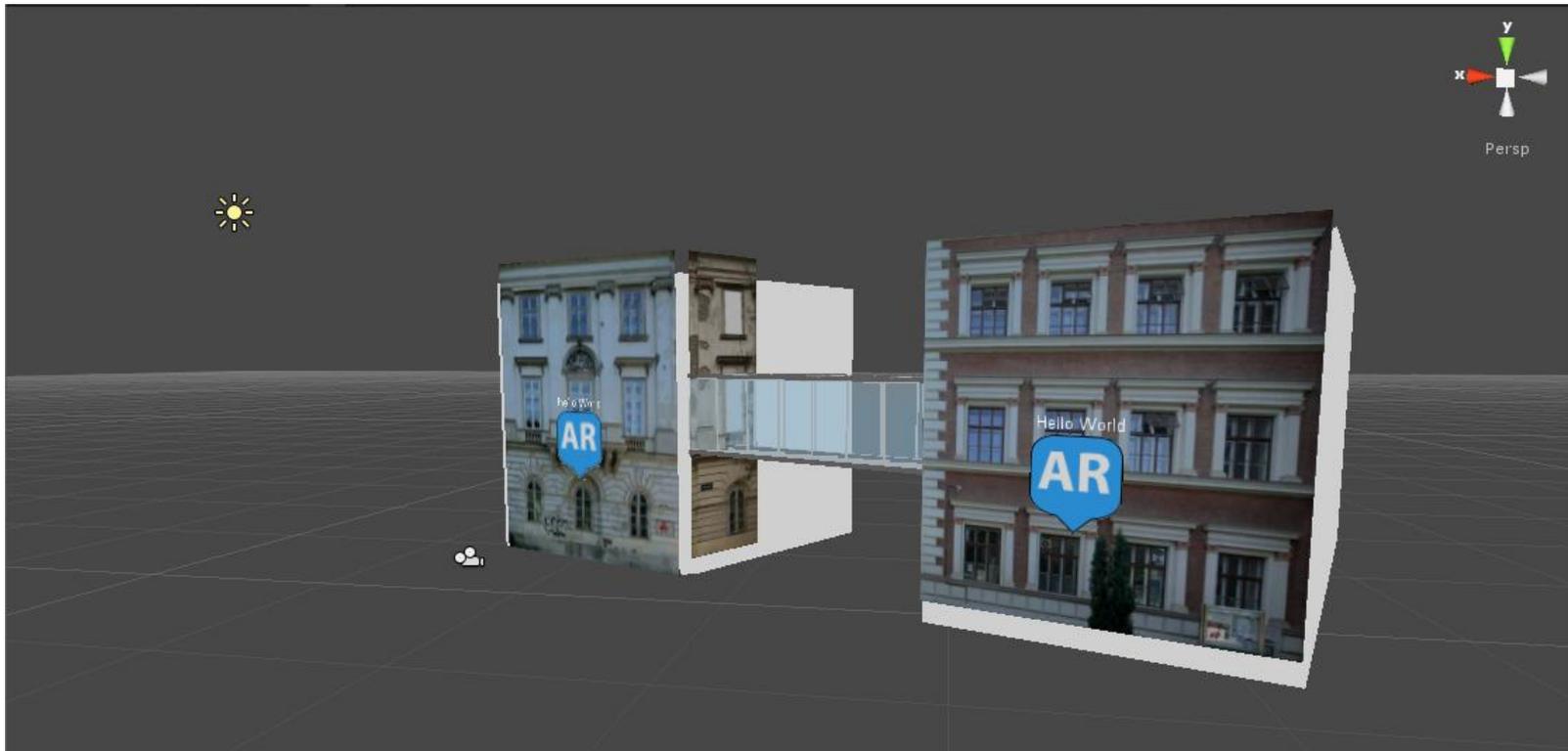
Problem: real object needs to occlude virtual ones
→ simple overlay is not sufficient

Occlusion Objects



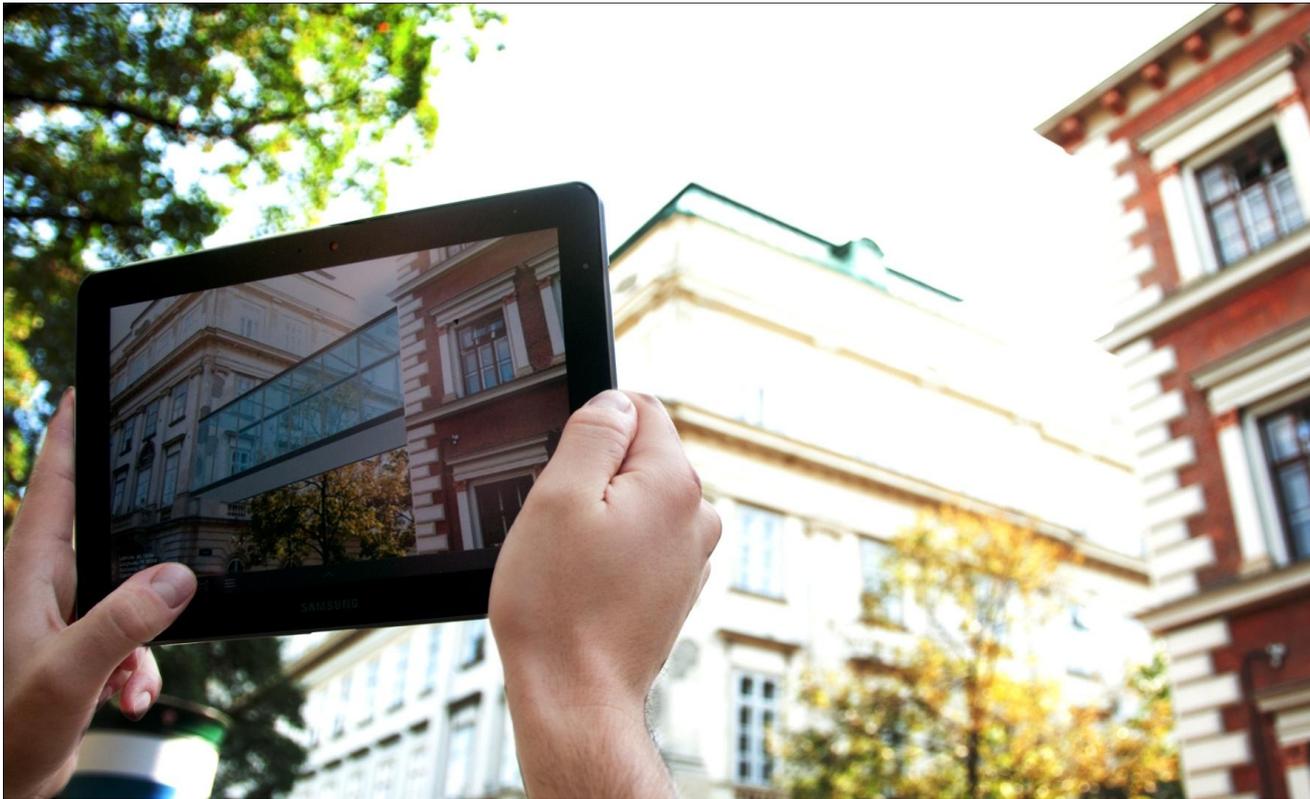
Occlusion Objects with special shader to correctly clip off the hidden geometry

Unity - Setup



Scene arrangement based on 2d plan (MZK provided by MA41)

Video



**AUGMENTED
REALITY**

by **QUALCOMM**



institute for architectural sciences
digital architecture and planning (iemar)

Conclusion

- + Multiple facades to position 3d model
- + Occlusion by neighbour buildings
- Not every facade useable
- Problems with shadows/reflections on facade

Outlook

- Simplifying the trackable positioning
- Trackables for different lighting situations
- Improve positioning using 3d scan of scene
- Database integration

Thank You:

MA41 - Stadtvermessung; TU Wien - Institut für Geodäsie und Geophysik, Institut für Kunstgeschichte, Bauforschung und Denkmalpflege; Qualcomm Austria Research Center; Michael Asperger, Paola Otero