

HaptiProjection: Multimodal Mobile Information Discovery

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Motivation

- Pico projectors now widespread
- Many new interaction possibilities
- But: little attention given to the transition between mobile and projected interaction
- Our focus: low-attention mobile information discovery

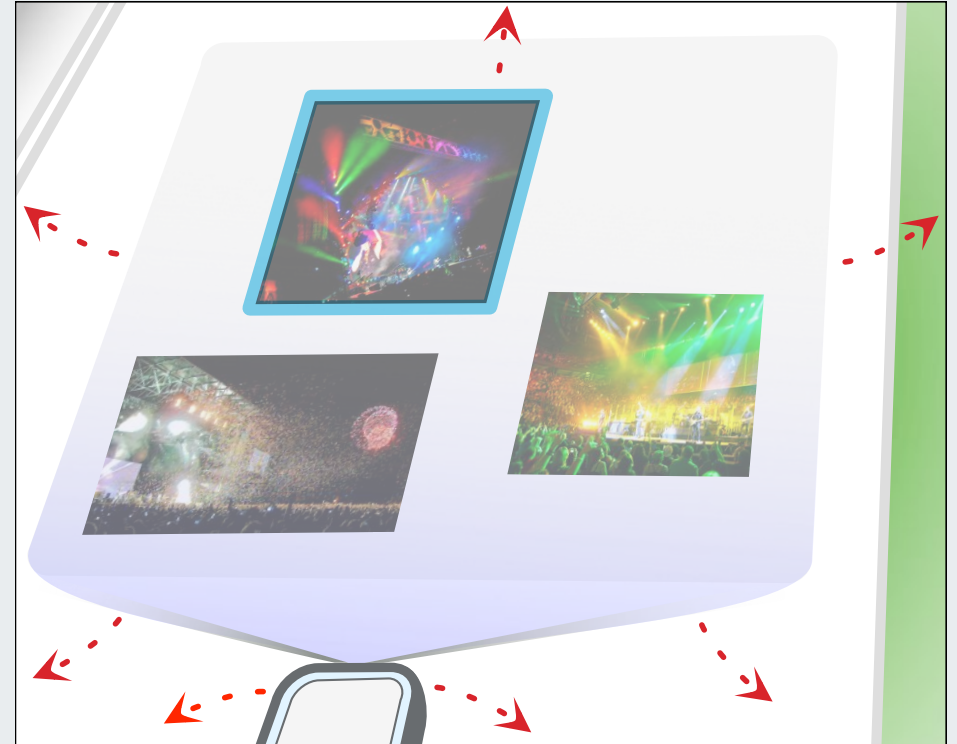
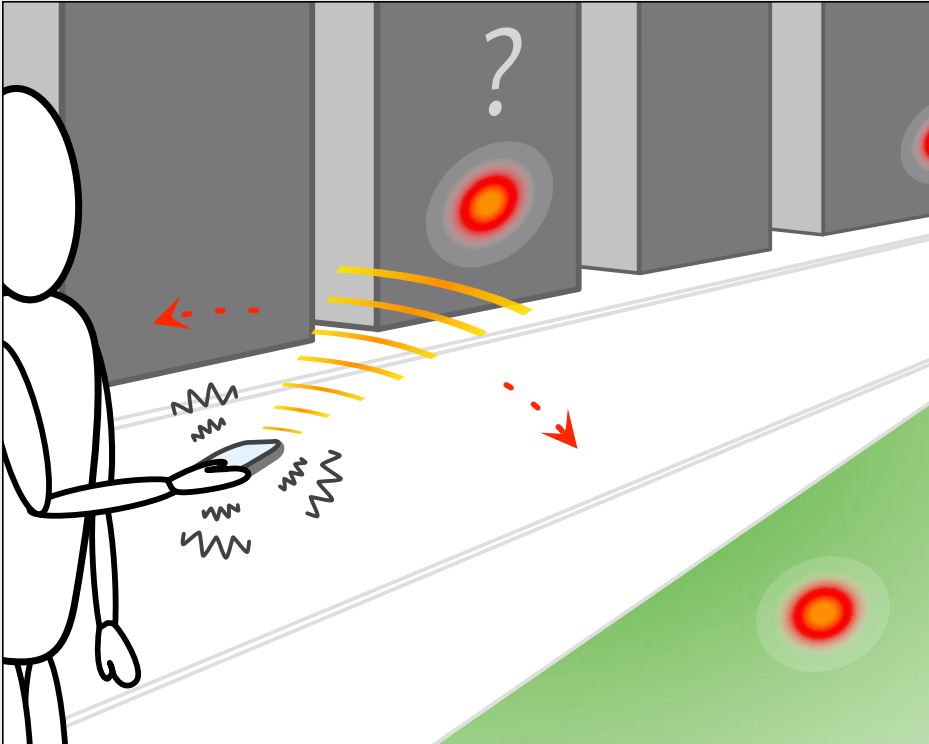
Background

- Augmented reality without headsets & backpacks - Beardsley *et al* [1], Mistry *et al* [7]
- Object manipulation - Miyahara *et al* [8]
- Single/multi-user projection spaces - Cao *et al* [2,3], Greaves & Rukzio [6], Raskar *et al* [9]
- User reactions and needs - Greaves *et al* [4], Wilson *et al* [12]

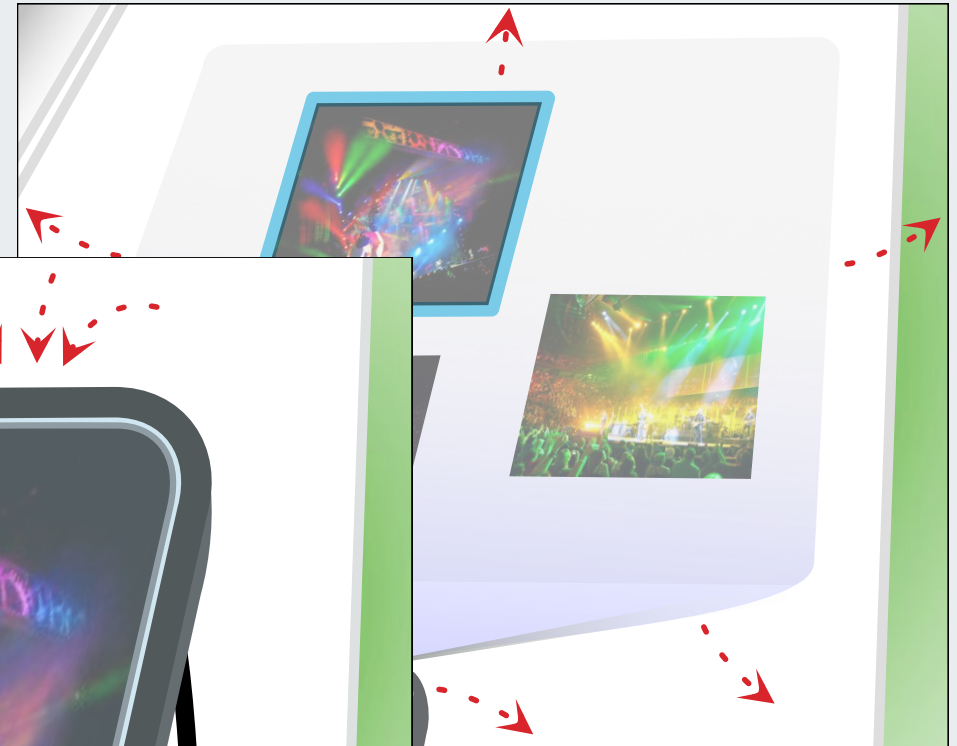
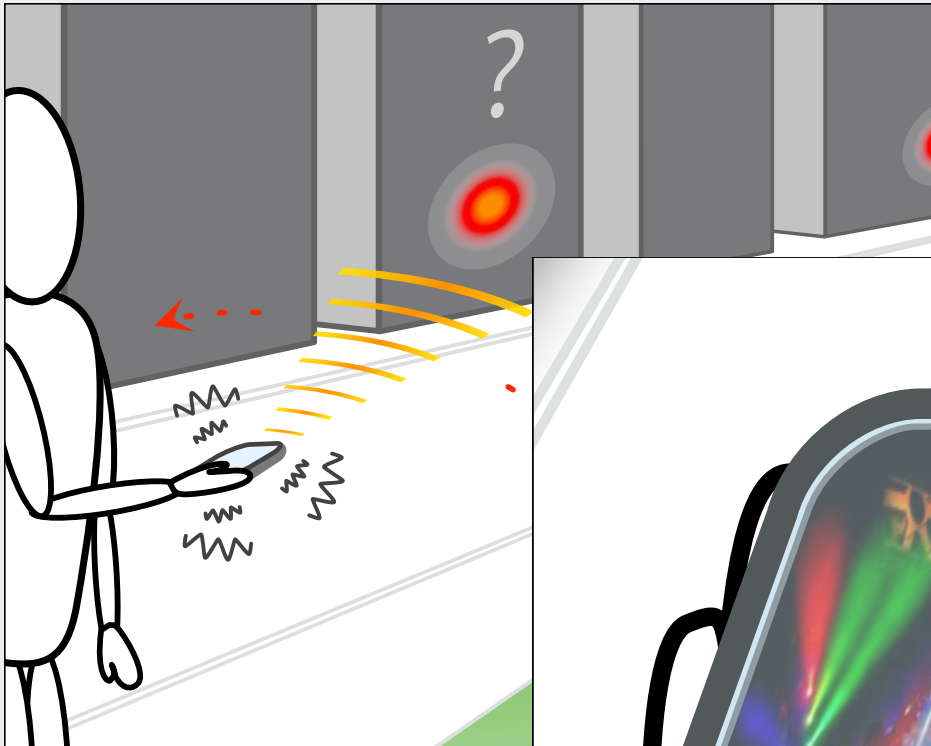
Proposed interaction

- Allow users to probe their environment for information whilst on the move
- Engagement with real-world surroundings at the same time
- Interaction:
 - Simple vibrotactile feedback for content discovery
 - Projection for browsing and sharing

Proposed interaction



Proposed interaction



Photos by anirudhkoul (Flickr)

Early prototype



- Building upon earlier tactile interaction work: gestures to discover content via vibrotactile feedback

Early prototype

- Once found, searchlight-style interaction to browse
- Movement correction via sensor pack rather than cameras + tags



Benefits

- Low-attention browsing, then sharing and collaboration when appropriate
- Searchlight interaction anywhere - no need for cameras etc.
- No formal study so far; informally:
 - Serendipitous browsing
 - “StumbleUpon for the real world”

Future possibilities

- Collaborative projection
- Fusing separate devices to create a shared projection space
- Share with friends or strangers by leaving content in public locations - geoblogging



Future possibilities

- Content manipulation
 - Currently we use the projection device - peephole/searchlight-style
 - Could use the phone screen as a window
 - Touch-based methods from mobile devices could offer more direct manipulation
 - Combining multiple projections allows several people to share in the experience

Future possibilities

- Projection surfaces
 - Currently we use a nearby blank surface: floor/wall/ceiling
 - As projection quality increases, more complex displays will be possible
 - Context-aware projection, although increasing processing costs, will allow more elaborate projected displays with future devices

Conclusions

- Tactile feedback and projection can provide content discovery and filtering in the real world
- Basic functionality already demonstrated; improvements to come
- Many possibilities for future interaction methods and techniques

Thank you

- Questions?
- cssimonr@swan.ac.uk
- <http://cs.swan.ac.uk/negotiatedinteraction>
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