

Telling a Story on a Tag: The Importance of Markers' Visual Design for Real World Applications

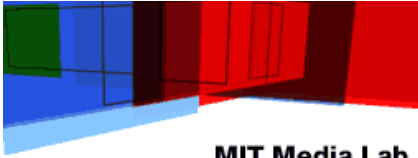
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now MIT Design Lab



Anecdote



postaprioritaria

€ 0,65

11.08.20

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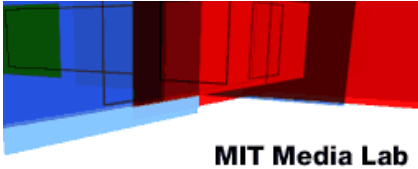
Poste

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TO: COSTANZA ENRICO

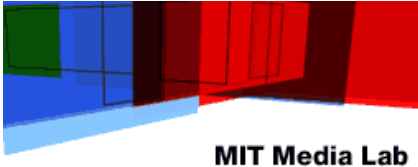
ROOM: BC 121 UNIT: LDM1





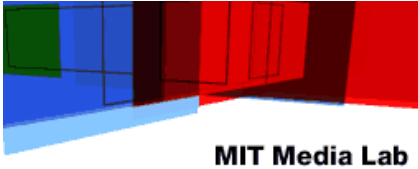
Background

- Tagging for Mobile HCI
- Unique identifier
- RFID
 - Invisible
 - Generally omni-directional
 - Range: cm to metres
 - Requires dedicated hardware
 - Reader
 - Tags (inexpensive)



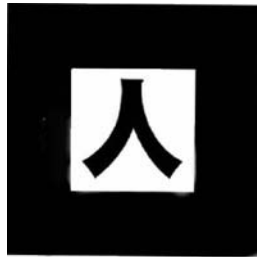
Background (cont.)

- Visual Tags
 - Visible tags
 - Limited range
 - Requires pointing to marker (directional)
 - No special hardware
 - Reader: camera + programmable phone or server
 - Tag: just print



Related Work

- All existing systems for visual marker recognition are based on geometry, i.e. shape



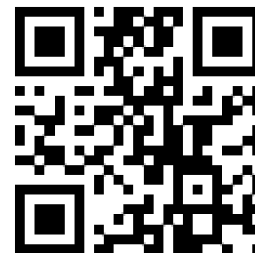
Artoolkit



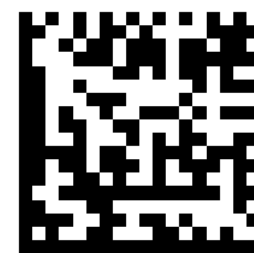
M. Rohs
(ETH-Z)



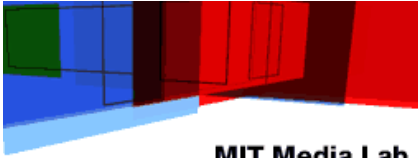
Spotcode



QR code



DataMatrix
(Semacode)

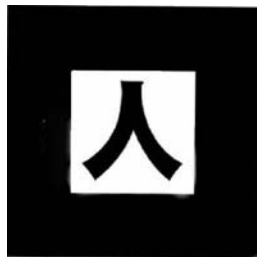


d-touch

- Comparison



Aquesta etiqueta forma part d'un projecte innovador impulsat pel MIT i la Generalitat de Catalunya per explorar noves formes d'administració pública i educació mitjançant telèfons mòbils. Si aquesta etiqueta et sap per error, trobaràs el QID sense retarda.
<http://mobile.mit.edu/etens>



Artoolkit



M. Rohs
(ETH-Z)



Spotcode



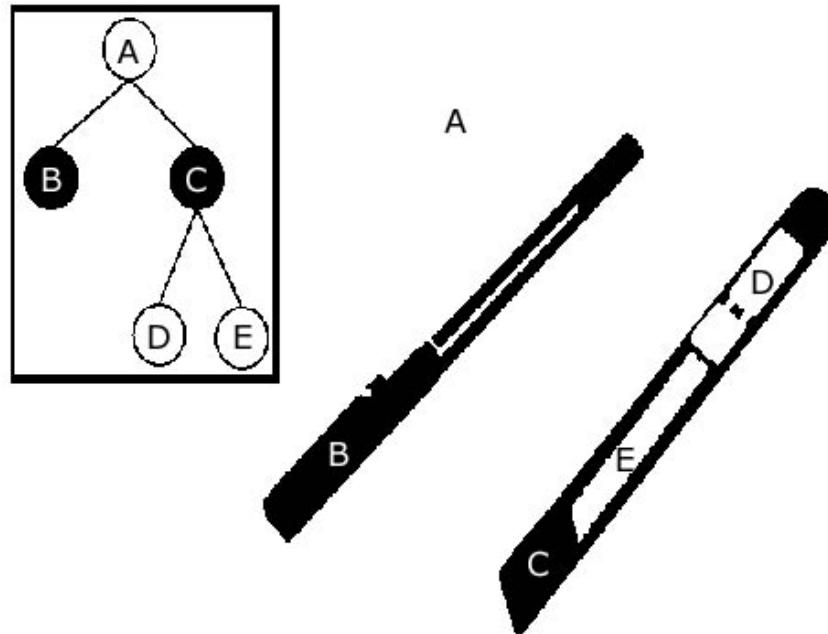
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DataMatrix
(Semacode)

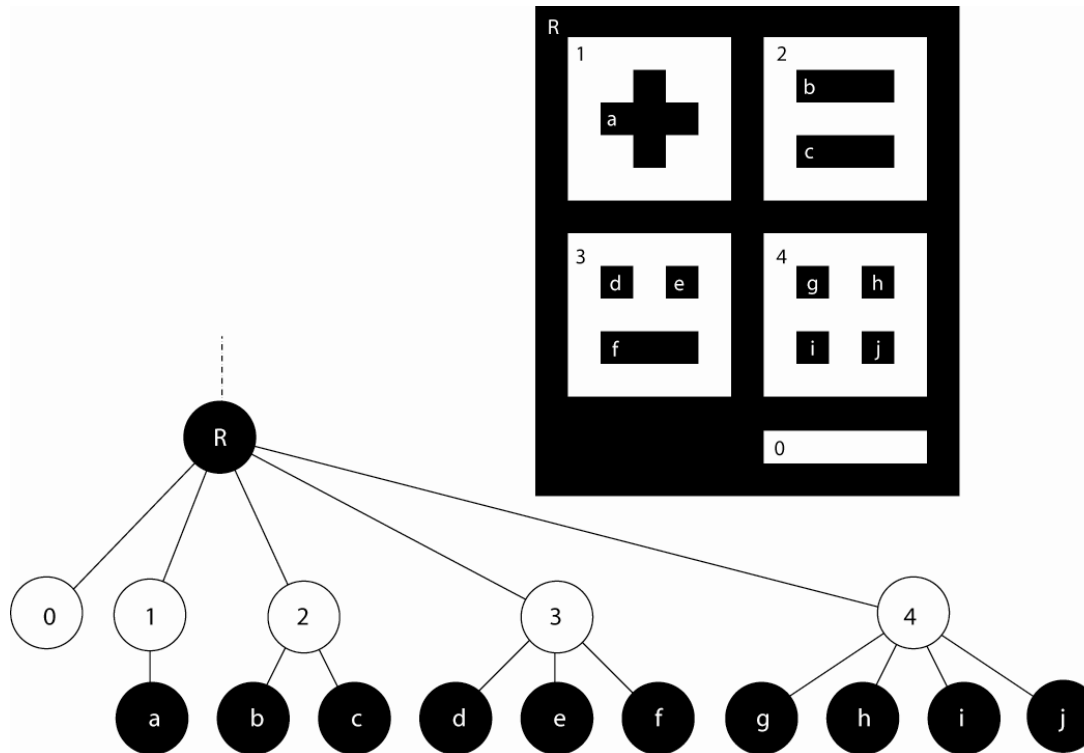
Topological Recognition

- Binarization (thresholding)
- Region Adjacency Tree



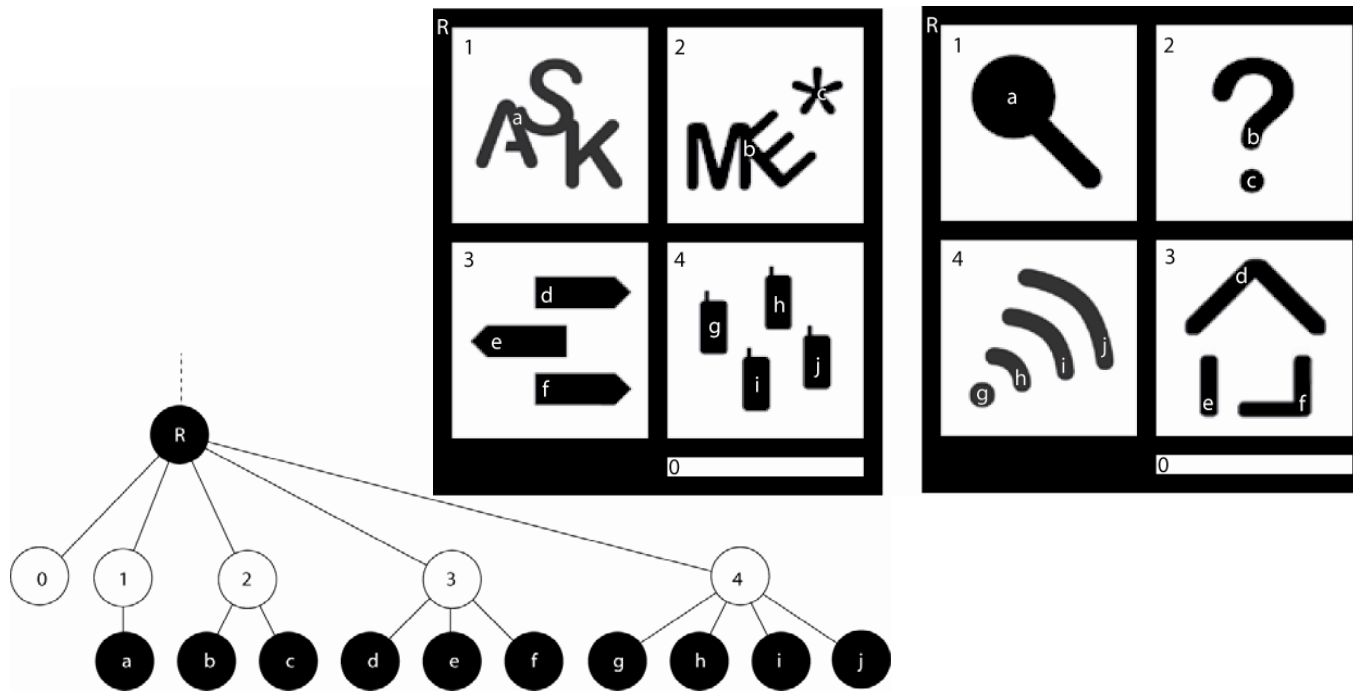
d-touch markers

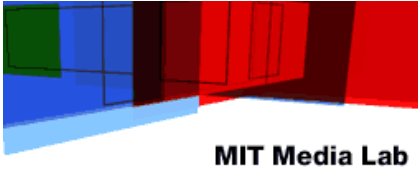
- Example marker with its tree



d-touch markers (cont.)

- Same topology different geometry



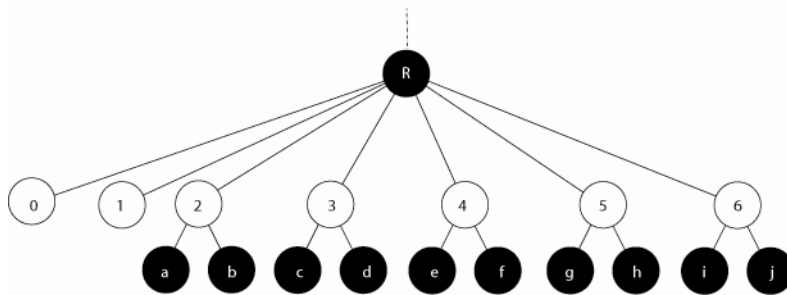


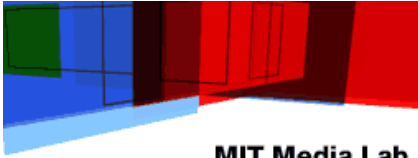
d-touch markers (cont.)

- Markers hidden in text



Media Lab Europe

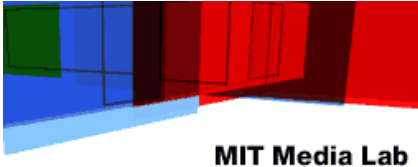




MIT Media Lab

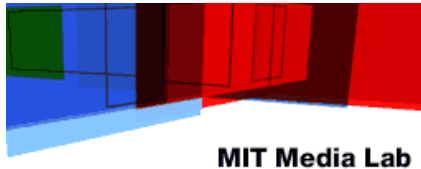
Electronic Lens

- VIDEO



Electronic Lens

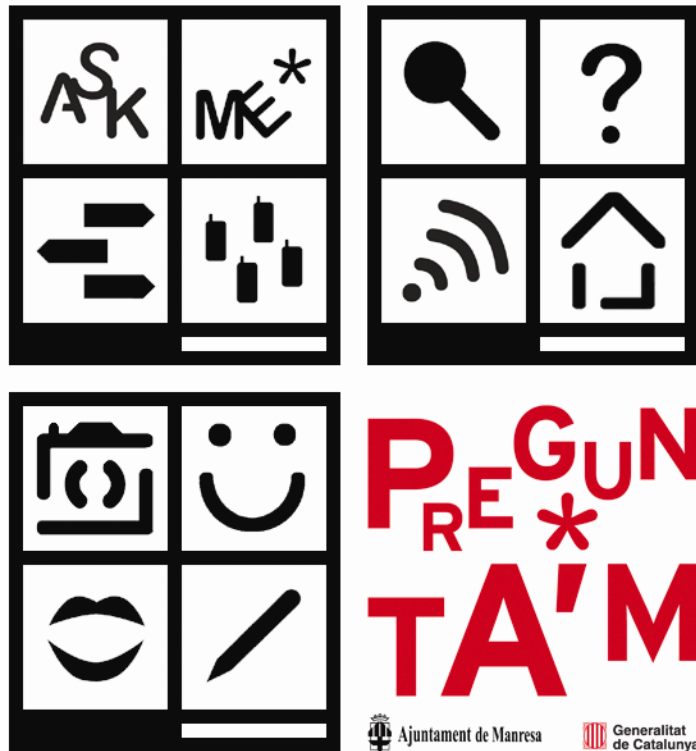
- Explore use of mobile technology in a urban context
- Social networking application
- Location based discussion
- Multimedia (primarily audio)
- Public and private discussions



Tag Requirements

- Official endorsement by Generalitat de Catalunya and Ajuntament de Manresa
- Authorization to place tags on facades of private buildings
- Tags need to communicate value
 - Visual design
 - Material

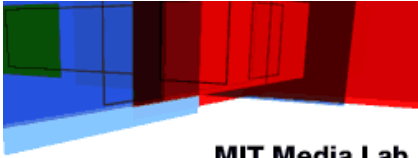
Manresa Tag



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<http://mobile.mit.edu/elens>

- Result of iterative process
- Approved by “client”
- 12000+ unique identifiers
- Functional and non-functional elements



Future Work

- Recognition algorithm formal testing
- Tag design and personalization without algorithm knowledge (AI)
- Large scale user study