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Design Considerations for Digital Image Libraries

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Outline

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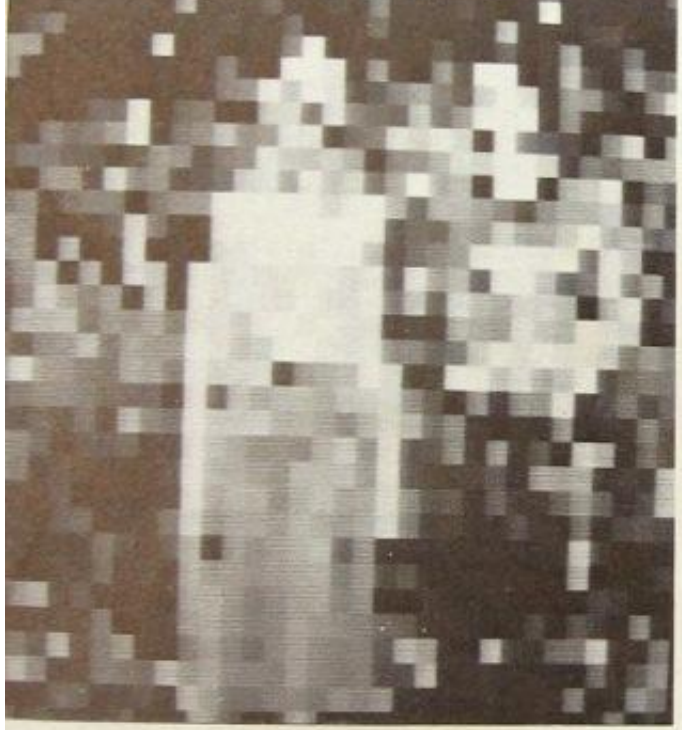
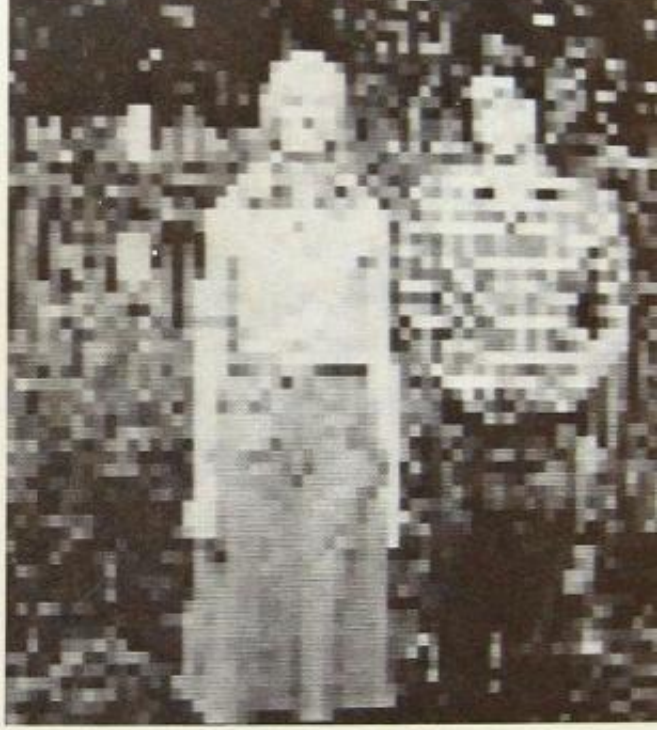
- Issues in constructing digitized photographic collections
- Design criteria based on image characteristics and usage
- Modelling information content using importance maps
- Apply modelling to Morija Museum and Archives example





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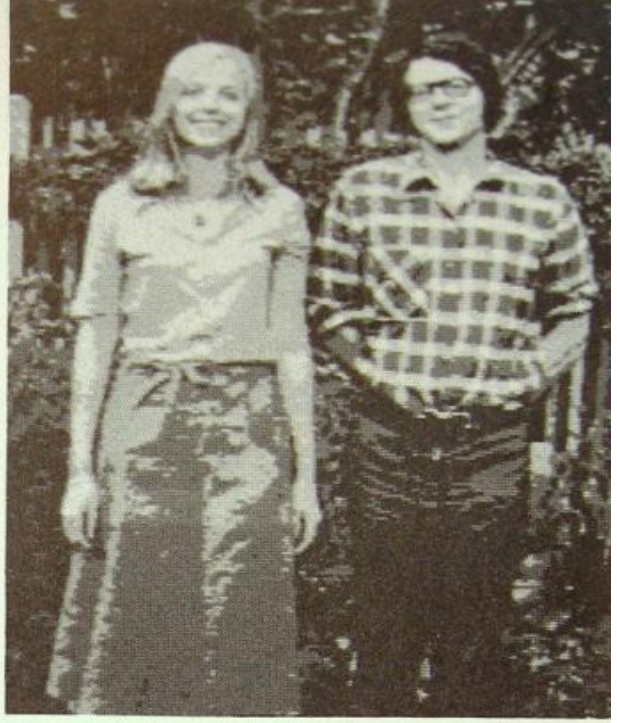

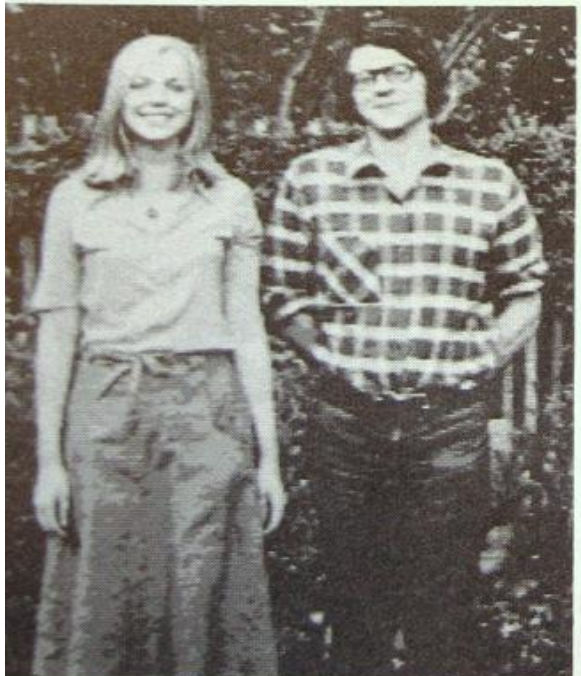

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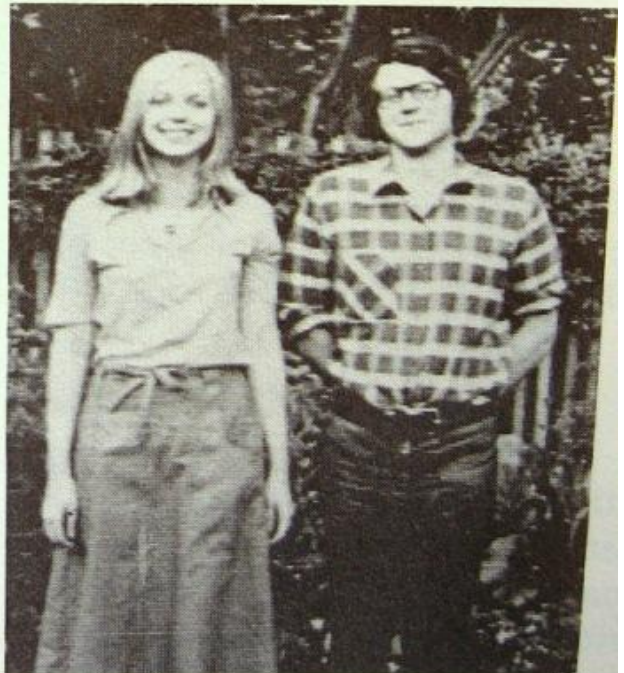

Issues

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- Emphasis on “fixed choice” for physical image properties
- Variety of usage and viewer situations and purposes
- Control of access efficiency and scalability (eg mobile)

Resolving Issues

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- Vary image physical properties according to content
- Tune library implementation to suit usage/viewer needs
- Provide hierarchy of library content representation

Digital Image Library Design

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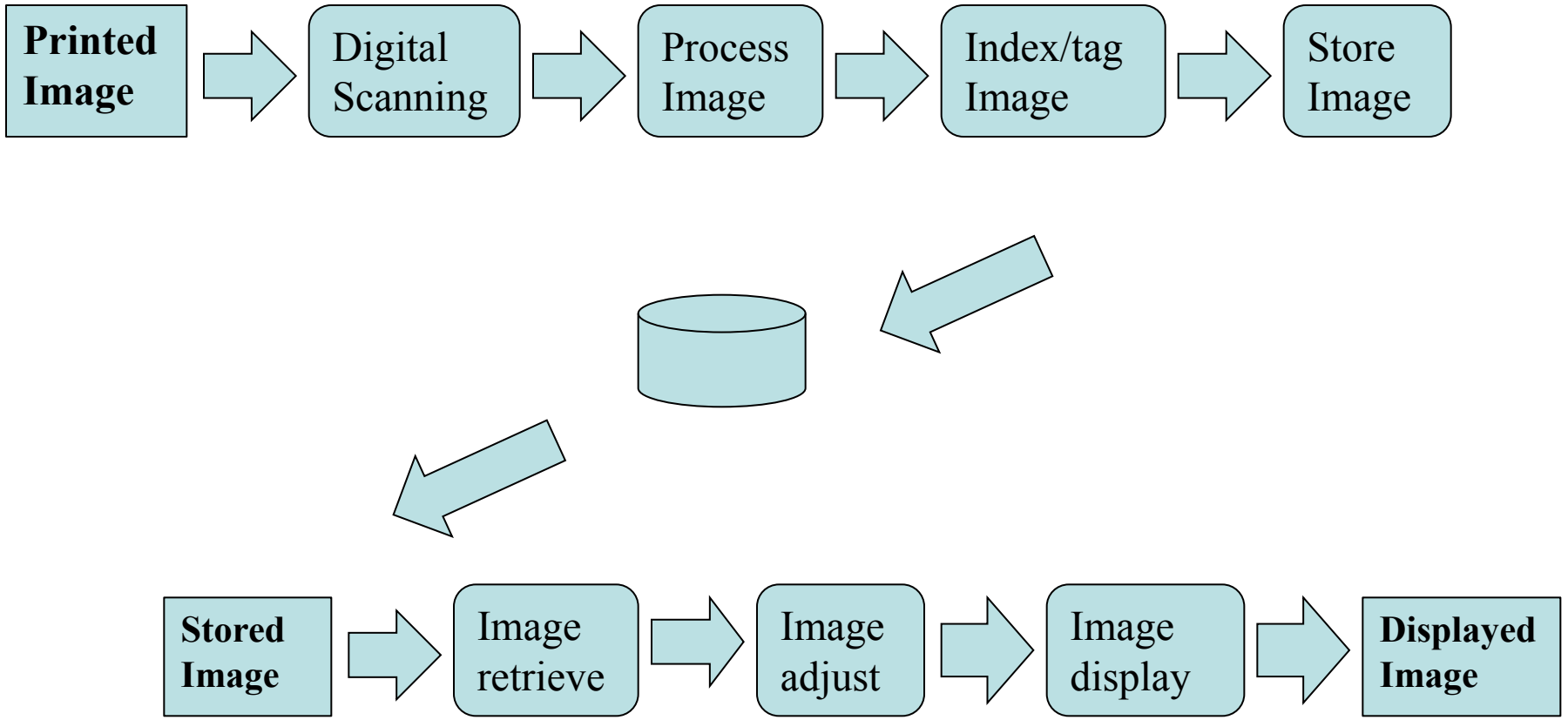

DIL Management - Usage Stages

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- **Input/Scan:** spatial resolution, greyscale/colour gamut
- **Processing:** noise, blur, contrast, crop, warp
- **Storage:** compression, purpose, content, multiple
- **Display/Print:** map to screen/page size and characteristics

DIL Data - Perceptual Factors

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- **Spatial:** pixel density, spacing, aspect ratio, shape, size
- **Intensity:** pixel brightness, contrast, colour values, gamut
- **Quality:** visual appearance, sharpness, clarity, aliasing
- **Information:** visual content density, localization, spread

Human Visual Perception

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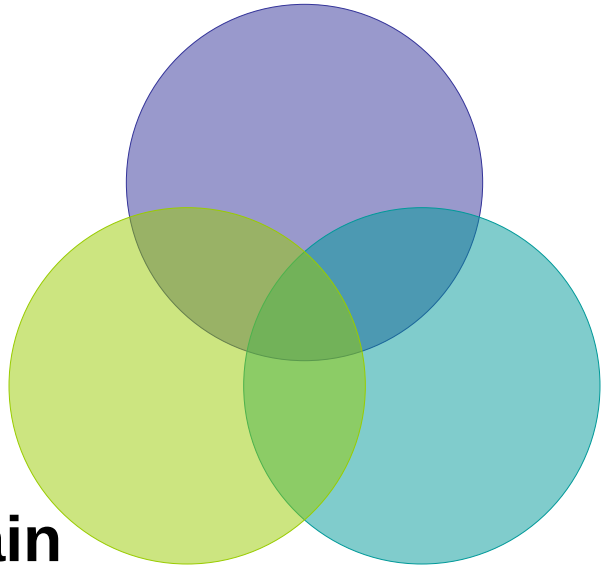
1 Sensations in Eyes



2 Processing in Brain

3 Models in Mind

Eye tracking

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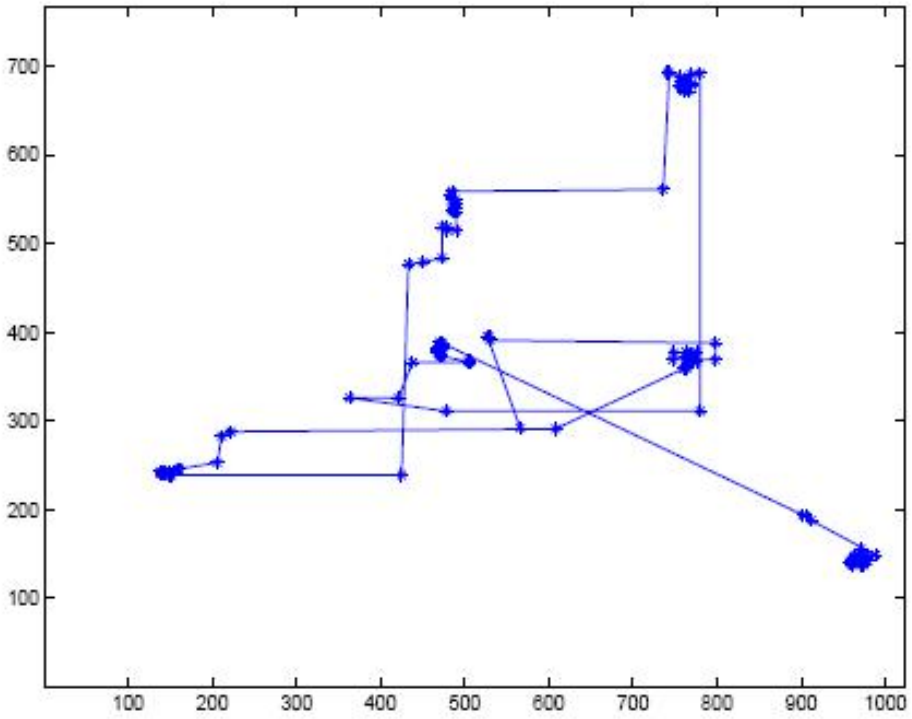
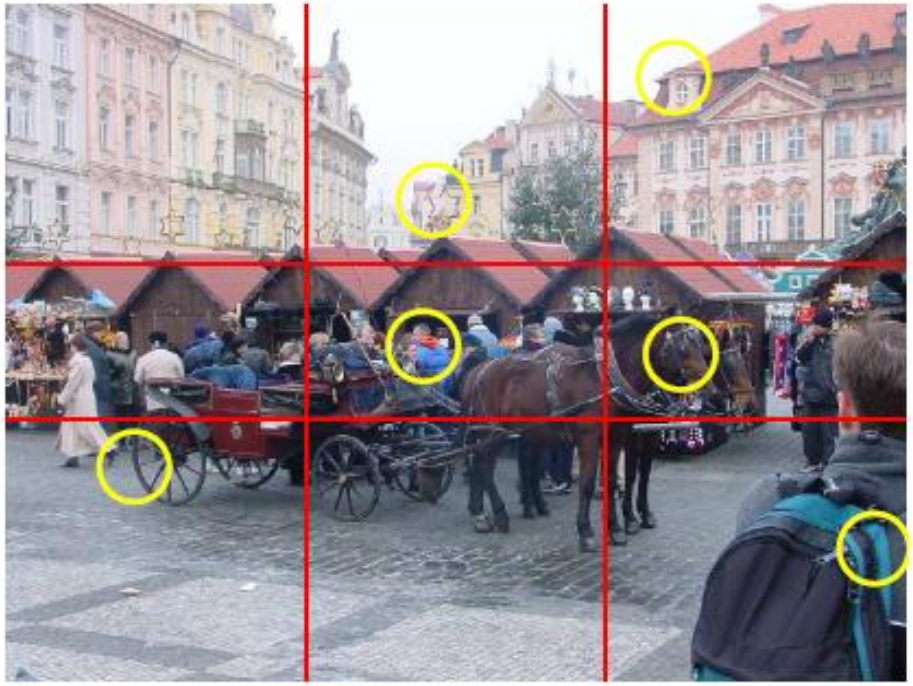


(a)



(b)

Successive eye positions and saccades. Positions of fixation of gaze.

Image Content "Importance"

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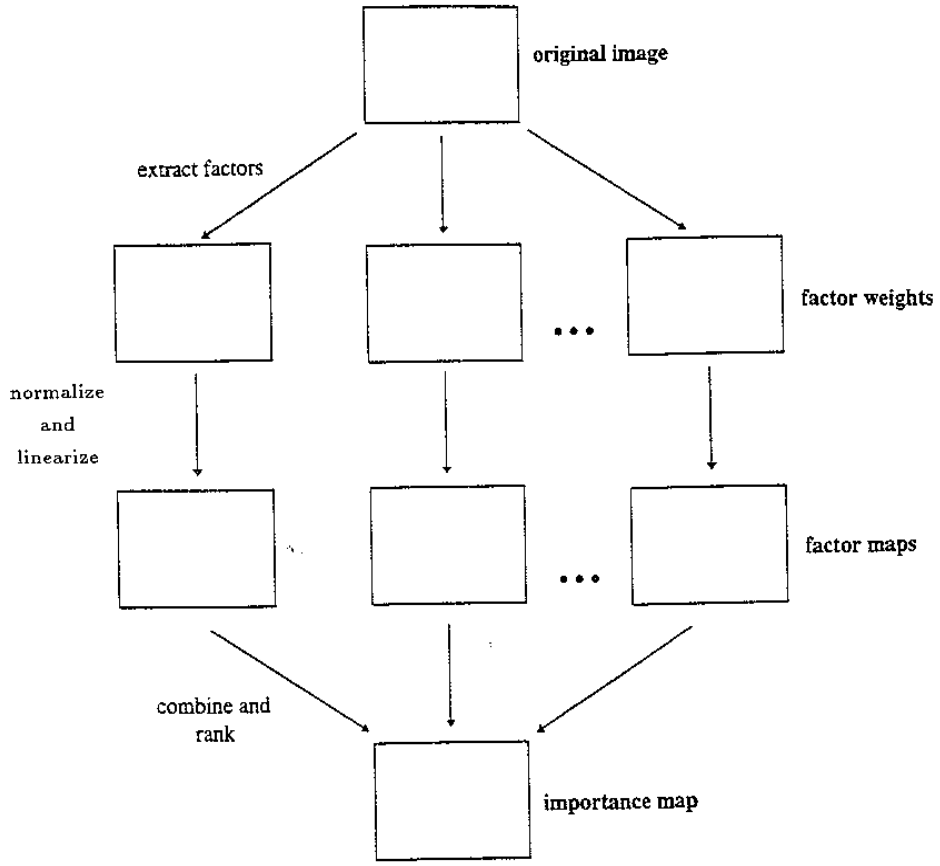

Fig. 2. Constructing an importance map.

Importance Mapping

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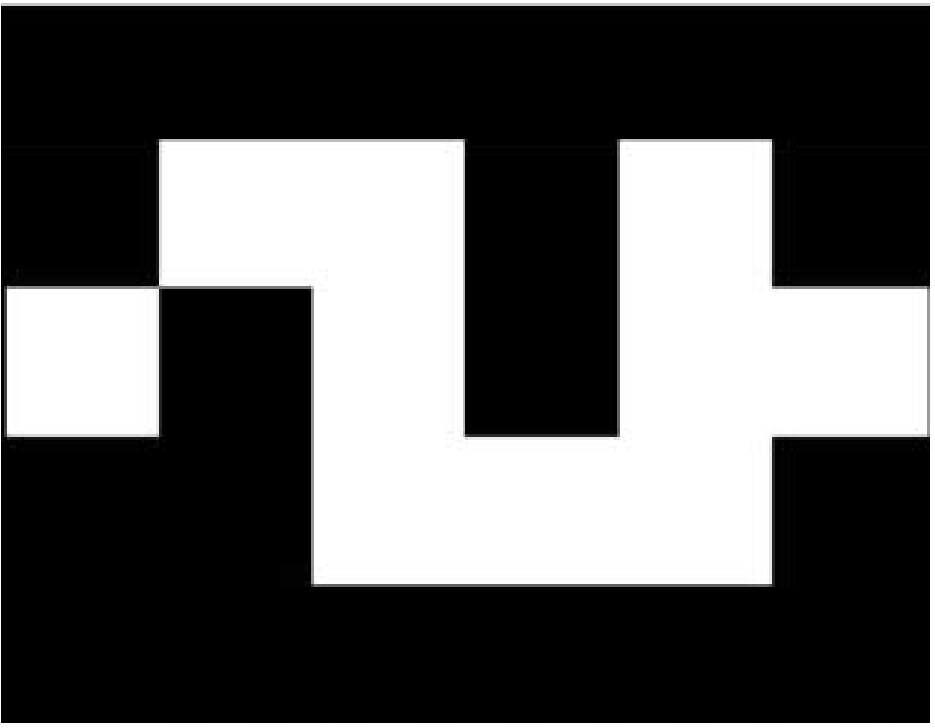
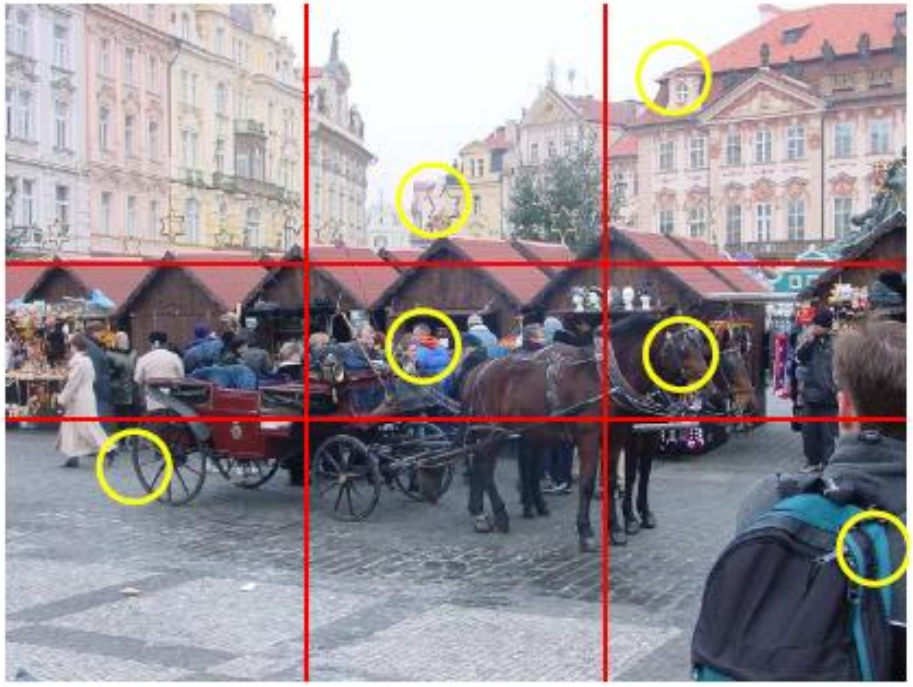


(a)



(b)

Locations of high importance.

Positions of fixation of gaze.

DIL Hierarchy – Image Versions

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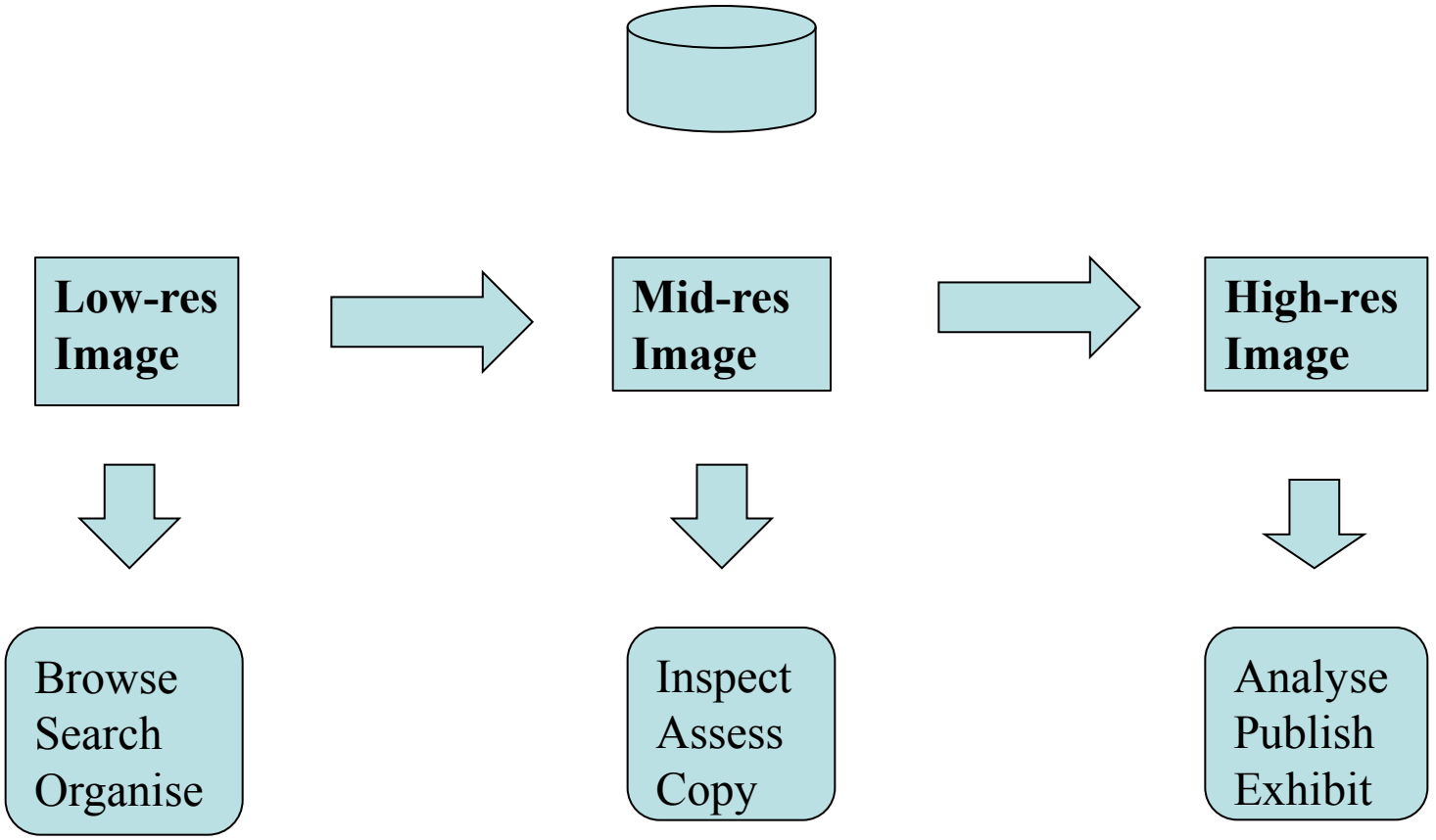

Morija Mission

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Morija Museum and Archives

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MMA User Group Needs

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- **Citizens and Tourists:** curiosity and browsing
- **School Students:** education and awareness
- **Scholars and Researchers:** content analysis
- **Sponsors and Agencies:** aggregation and publicity

MMA Collections

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- **Missionary history**: buildings, people, scenery
- **Sotho culture**: clothing, household, hunting
- **Geological items**: dinosaur bones, fossils, samples
- **Other materials**: maps, drawings, rock paintings

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Example: Missionary History

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- Prints range from 3x4 inch to 6x8 inch monochrome
- Digitize on flatbed scanner 400dpi x 8bpp (4-5MB raw)
- Reduce in software to 200dpi and 100dpi JPEG versions

Example: Missionary History

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- Store with text and tags in Microsoft Access database
- Browsing software “eMuse” to retrieve thumbnails first
- Screen quality versions obtained by clickthrough
- Reproduction quality versions held for access on request

Conclusion

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- The project is still in an “investigation” phase
- The design principles have been useful for decisions
- Applicability needs to be tested on some other cases

Contact Information

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