METADATA GENERATION FOR CULTURAL HERITAGE

Creative Histories – The Josefsplatz Experience

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Talk Outline

• introduction
• project overview
• metadata extraction
• metadata processing
• speech synthesis
• automatic tour generation
• summary
Creative Histories
Creative Histories

3d model of the Josefsplatz & Prunksaal reconstructed from (historic) photographs, paintings, maps
Creative Histories

navigation of 3d space and embedded meta-information across different epochs on PC and mobile phones
Conceptual Model

depending on

- spatial and temporal position in the model
- user interests (categories, level of detail)
- already accessed information (history)
- device used (mobile phone, desktop)

the 3d model will change and
different information will be accessible to the user
Metadata Component

Main Tasks:

extraction of metadata from legacy documents

semantic representation & querying of metadata

automatic generation of presentations adapted to context, content and device
Metadata Extraction

- selection of relevant documents by a human expert
- documents courtesy of the ONB include html documentations, encyclopaedias, exhibition materials
- automatic extraction of metadata using document structure and mark-up (citations)
Metadata Processing

• interlinked 'presentation objects' (PO) of types *image, text, video, audio, vrml model* are stored in a RDF/XML framework

• PO are enriched with meta-information such as temporal and spatial anchors, category, file size, image dimensions, duration

• textual data are stored sentence wise
3rd party tools used:

Database & Modeling:
- Sesame RDF Database
- Apache Tomcat
- Protege Ontology editor

Text-to-Speech Synthesis:
- MARY (diphone)
- Loquendo (unit selection)
Speech Synthesis

**motivation:**
restrictions on display of text on mobile devices, flexibility of presentation

**tools:**
- automatic preprocessing
- computer-aided compilation of domain lexicon
- Loquendo (unit selection)
- MARY (diphone)
Speech Synthesis

unit selection quality low for domain vocabulary
diphone synthesis better adaptable

... den Schatz Friedrichs III. nach ...

... den Schatz Friedrichs *des dritten* nach ...

Pallavicnipalais, Redoutensäle, Mittelrisalit,...
Tour Generation

online generation of interactive tours adapted to

- device requirements,
- context (user interest, position, history),
- content (media types, categories)
composed of: (representations of) presentation objects, internal connectors, external connectors; player control commands (position, orientation)

user interaction: navigate forwards/backwards view/skip optional material return to 3d model view
 metadata DB
content selection

user history DB

PO (images, texts, audio files, videos, vrml models)

user_id
SpatialAnchor
RelevantCategory
TemporalAnchor
user_orientation
user_position

interface params
device

MPU serialization (weighted vector distance)
apply internal & external connector templates
convert to device-specific output format

tour generation

calculate Minimal Presentation Units

SMIL
XHTML
timeline format
Tour Generation: Alignment

images are temporally aligned with speech
• temporal position of pictures determined by link position and clause structure
• extraction of timing information using MARY

... zeigen das Haus Österreich, die Steiermark, Tirol, und Kärnten, die Länder in denen ...
Summary

major characteristics revisited:

automatic extraction and processing of presentation objects from legacy documents

storage of presentation objects along media type and interface dimensions (such as category, temporal anchor) in RDF/XML format

online generation of interactive tours adapted to context, content and device
Project Partners

Creative Histories – The Josefsplatz Experience  www.josefsplatz.info

Austrian Research Institute for Artificial Intelligence (OFAI)
www.ofai.at

Austrian National Library (ÖNB)
www.onb.ac.at

Zentrum für Virtual Reality und Visualisierung (vrvis)  www.vrvis.at

Forschungszentrum Telekommunikation Wien (ftw)
www.ftw.at