Digitisation to Presentation
Building Virtual Museum Exhibitions

Manjula Patel, Martin White, Krzysztof Walczak, Patrick Sayd

UKOLN, University of Bath, UK
Centre for VLSI and Computer Graphics, University of Sussex, UK
Department of Information Technology, The Poznan University of Economics, Poland
Image and Embedded Computers Laboratory, Commissariat à l'Energie Atomique, France
Goals of the ARCO Project

- Develop innovative technology and expertise to help museums create, manipulate, manage and present cultural objects in virtual exhibitions both within museums and over the Internet.

- How? By building a set of tools and processes from digitisation to visualisation:
  - Digitise artefacts using stereo photogrammetry
  - 3D modelling and refinement
  - Database and content management
  - Visualisation in a virtual or augmented reality environment
  - Interoperability, i.e. an open architecture
    - XML data exchange between tools and other systems
    - Internet, web, graphics and metadata standards

- Why?
  - To allow museums to create virtual museums and galleries
  - To enable interaction with digital representations of archived collections
ARCO Prototype Systems and Components
Digitisation of Artefacts (Object Modeller)

Requirements of a custom built stereo digital camera system:

- portable in order to gain access to fragile artefacts
- device should not touch rare or fragile objects
- no prolonged periods of artificial lighting
- ease of use for museum staff who are not experts in 3D measurement
- automated stereo reconstruction as far as possible
- result should be an accurate 3D model of the artefact in terms of shape, texture and resolution
Augmented Reality Interface (ARIF)

- Visualisation of ARCO media objects from the database (e.g. VRML models, metadata, pictures, virtual exhibitions)
- Three visualisation interfaces
  - Remote Web Interface
  - Local Web Interface
  - Local AR version based on ARToolKit

Remote Web Interface in a Browser

Database Navigation

Selected Media Objects

Media Object Selection
Dynamic Modelling with X-VRML

- X-VRML – high-level XML-based language for creating dynamic VR models and parameterised presentation templates
- Dynamic creation of ARIF contents by combining data and X-VRML templates
- Template instances for:
  - Search interfaces
  - Parameterised browsing
  - Virtual exhibitions
- Presentation Domains
  - Same database content visualised in three different ways by applying different X-VRML templates
Conclusions

- ARCO is developing an open architecture that integrates state-of-the-art with ARCO specific technologies to enable museums to build virtual exhibitions
  - Digitisation and modelling of 3D museum artefacts (OM)
  - Refinement and creation of the 3D virtual museum artefacts (IMRR)
  - Object relational database and content management application (ACMA)
  - Visualisation of museum exhibitions in a virtual environment (ARIF)
  - Integrated through XML technologies (X-VRML, AMS, XDE)

- Visit us at the ARCO website:
  - http://www.arco-web.org/