Report on the visit to the Center of Excellence MTA-SZTAKI (Budapest – Hungary)

Harangozo Arpad, Ph.D., Bucharest - Romania

October, 07th – December, 06th, 2003

Firstly I would like to take this opportunity to express my gratitude to the EU Commission for giving me the opportunity of visiting and working at the Centre of Excellence MTA – SZTAKI. Working together with the scientist from MTA – SZTAKI was a very important experience in my professional career. The CoE program allowed me not only to consolidate my cooperation with the CIMLabor/SZTAKI team but also to develop new collaborations with the GML/Geometric Modelling Laboratory and with Budapest University of Technology and Economics (BUTE) (see the abstract of the submitted CRAFT proposal)

Our team has began collaborating with the CIMLabor group of Prof. George Kovacs since 1999 mainly in the field of using multimedia techniques and tools for digital preservation and restoration of the cultural heritage. During my stage at SZTAKI I had the possibility of interacting with several scientists and/or departments of the Institute. The collaboration started with the GML/Geometric Modeling Laboratory in the field of 3D reconstruction should be mentioned in this sense.

My research interest is focused on multimedia techniques and tools. More precisely on using these techniques in several domains like digital preservation of cultural heritage, assuring a higher accessibility to the results of scientific research or to the cultural heritage both for the citizens and for the professionals etc.

One important thing to note is that some years ago, viewing realistic 3D models was the domain of high-end workstations. But the graphics performance of usual PC's has heavily increased in the past years and today every Standard-PC features a high performance graphics card at low cost. Thus a broad audience is able to view 3D models in real-time on their computer at home, giving them the opportunity to fly though a cultural heritage or view it from different angles. So, 3D images / objects, as well as audio and video clips, is

getting more important for modern CD ROM/DVD ROM productions, because they allow people to "experience" the cultural heritage much better than on a photographs. 3D images /objects could be geometric models of cultural assets – surface models, wireframe models and textures.

In this sense our aims is to develop practicable knowledge on how to create , manage and improve the digital objects along their life cycle: digitizing, low level / high level processing, managing distributed collections of large archives etc

3D images /objects could be created in several ways. The GML team use a 3D laser scanner which create a wireframe model and than they fit a texture on this model. The major advantage of the method is that it's possible to obtain a very precise reproduction of the original object. On the other hand the 3D scanner is a very expensive device and also they need a huge processing power.

A less expensive method, more accessible for the SME's but also less accurate, is to take several photos of the object from different angles and than to reconstruct the original object by using a commercial software like the QuickTime VR.

A sound analysis will be performed in order to underline the advantages (or disadvantages) of the 2 methods and also to establish their applicability range.

An other important goal of my stage was to analyze and assimilate the results obtained by the CIMLabor team in the Digital Factory project: the establishment of tele-presence, customer witness and virtual reality possibilities at industrial sites by means of multimedia techniques and tools. One very important thing to underline is that they obtained these results by using only standard, low cost, very accessible devices like webcams, microphones, standard PC's etc.

During the stage in Budapest I took the opportunity to participate to the IDEAL-IST workshop. As a results of the contacts made here (especially with the scientist from Budapest University of Technology and Economics – BUTE) it was possible to join a

consortium and to submit a CRAFT proposal on using smart IT solutions to the solid methodological approach that rules the restoration and conservation field (see the attached abstract of the proposal).

Bucharest, December, 08th, 2003

Arpad Harangozo, PhD

Methodological Approach of a Pilot Project for the Restoration & Conservation of Cultural Heritage in a Software Tool

MARPHOL

November 2003

Co-operative Research Project

List of participants

LABOR	Italy
CSG Palladio	Italy
GEMA Art	Czech Republic
Aletheia	Italy
Digital Holding	Estonian
NOI Media Print	Romany
Dynamic Digital Bunch	Italy
Istituto Centrale di Restauro	Italy
Society Art Technology	Canada
Budapest University	Hungary
Rome University	Italy
Prague University	Czech Republic

Coordinator name	Alfredo Picano
Coordinator organisation name	LABOR S.r.l.
Coordinator email	a.picano@labor-roma.it
Coordinator fax	+39-06-6780091

Methodology for a Pilot Project….

Marphol

Strategic objectives addressed

The **MARPHOL Consortium** will apply smart IT solutions to the solid methodological approach that rules the restoration and conservation field based on these objectives:

➔ Integrating the correct **Methodological Restorers' Approach**

➔ Building an **Open Modular System**

➔ Allowing a significant financial **reduction** of **costs** and **time spent** on the diagnostic checks

➔ Addressing EU Policy "*The protection of cultural heritage and associated conservation strategies*"

Proposal abstract

MARPHOL aims at the development and the assessment of a new methodology for the restoration and conservation of the cultural heritage, which will lead to a more comprehensive and systematic approach towards this subject. It will provide an opportunity to endow the community with an innovative system of **integrated software tools and methodology** that allows a significant financial **reduction of costs and time spent** on the diagnostic checks, rendering restoration and conservation activities much more affordable for anyone. Moreover, all historical, artistic, technical and scientific data collected through this new system once turned into homogenous data will be easy to read and analyse even by non specialised personnel and the creation of related data base through digital archiving applications will foster the development of that shared vision able to make globally visible the rich diversity of the European cultural heritage content.

The definition and assessment of these new standardised software tools and software-based methodological process will be achieved also on the basis of a study to be carried out on some historical buildings in Europe (in first instance, it has been thought to focus the attention on historical buildings such as the castles); and **MARPHOL** will be based on the analysis of an experimental database, constituted by the results of the preliminary study; a **Decision Support System** and **Fuzzy-Logic** approach seems to be the best way to manage the huge data collection/analysis. The project will be developed thanks to the efforts of several Architectural Departments in Europe and of SME involved in restoration and conservation of cultural heritage. Beside these, there will be another kind of partner, the IT performer: a Department of Informatics Engineering and a SME with solid competences in neural network software and data collection.

MARPHOL, by taking an important step forwards the state of the art, thanks to the effort of strong based methodologies and technologies, will ensure the addressing of several **EU policies** and main strategies concerning the **Cultural Heritage** and **EU technological gap** and **integrates the gender dimension** because of its own nature; during the project the women effort will be strong.

The validation in cooperation with RTD and End Users of different EU Countries will perform the right exploitation, giving a wide distribution and achieving a good visibility of both to the device and the consortium**.** Moreover, the presence in the Consortium of Partners belonging to other Countries, such Estonia and Canada, will give a well based transnational and cooperative skill to the **MARPHOL Project**.