

# *Centro de Computação Gráfica: the New Mission and the Future*

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## **History and Background**

The Centro de Computação Gráfica (CCG) was constituted on 3 November 1993 at the request of the ZGDV and the University of Coimbra and became fully functional on 27 December of the same year.

The CCG has been established as the Portuguese flagship of the INI-GraphicsNet network with a mission to implement in Portugal the method of applied research and ways of working, already successful in Germany, and to establish a link with the Portuguese speaking African countries.

With a new constitutional member (the University of Minho), new constitution and bylaws, and a new management, and also due to the process of national expansion, the CCG and the University of Minho (UM), one of the most prestigious contemporary universities in Portugal, initiated a careful process of transformation and restructuring in October 1999.

This process was specially accelerated because of the friendship and vision of two prominent figures: Prof. José L. Encarnação, president of ZGDV, and Prof. Altamiro Machado, professor at the UM and member of the Executive Board of CCG. For approximately one year, they designed

models, promoted discussions and managed to involve the entire University of Minho (UM) in this process, on the one hand, and the ZGDV boards and CCG members, on the other, culminating in the revised constitution and bylaws for the Centro de Computação Gráfica in March 2001. This agreement between the ZGDV and the University of Minho has been signed in Braga on 20 April 2001 in the presence of about two hundred guests from industry, academia, state and religion. Prof. Altamiro Machado could not participate in this ceremony because, sadly, he died two days after the CCG meeting which accepted the new mission. The meeting had been held on 20 March 2001. In reverence of his memory, we have to complete his vision of a strong CCG conveying R&D activity of excellence in close co-operation with his University of Minho within the whole INI-GraphicsNet.

In context of this act, the University of Minho became a shareholder, and together with ZGDV, both are now constitutional members of CCG, whose headquarters have been transferred from Coimbra to Guimarães at the University's Azurém campus. About two dozen members from industry, commerce and state support CCG by being (minority) share-holders, by participating in its association boards or by promoting partnerships in common projects.

CCG in law, is a private, non-profit Association and its objectives are to render Research and Technology Development (R&TD) services, to teach and train, to participate in activities concerning industry consulting for the use of Computer Graphics and its applications, for promotion and fund-

## **German Abstract**

In diesem Artikel berichten wir von den Entscheidungen, die der Neu-gründung des CCG im März diesen Jahres zu Grunde liegen. Zunächst werden wir Ihnen einen Überblick über die Aktivitäten des CCG während seiner Anfangszeit verschaffen: von seiner Gründung in Coimbra 1993 bis Ende 1999. Während dieser Zeit hat sich das CCG in Portugal als »Vorzeige-Institution« für graphische Datenverarbeitung etabliert.

Mit neuer Satzung und neuem Satzungsmittel und aufgrund nationaler Expansion initiierten das CCG und eine der zur Zeit anerkanntesten Universitäten Portugals, die Universität von Minho (UM), im Oktober 1999 einen Umwandlungsprozess. Man einigte sich auf eine neue Satzung des CCG und für das Institut begann eine neue Phase. In Hinblick auf eine enge Zusammenarbeit mit der Universität von Minho und mit dem INI-GraphicsNet wurden neue Arbeitsmodelle entwickelt. Auch wurden für das CCG neue landesweite Herausforderungen und Ziele definiert und angegangen.



**Figure 1: Virtual Oceanarium:  
A View of the Central Tank**



**Figure 2:**  
Aspect of a Reconstruction of a private Roman House (Project – Virtual Tour to Bracara Augusta)

tion until October 1999, who played an important role in these early years by using his personal engagement in proclaiming the CCG message, acquiring projects and promoting the institutional image throughout the country. He was the visible personification of CCG during the first phase of its existence.

CCG supported the local Computer Graphics community mainly through the joint realization of conferences, workshops and demonstrations, and, especially by working together on R&D projects.

An overview of the relevant experiences on the realization of R&DT events can be divided as follows:

- The 8th edition of the Portuguese Computer Graphics Conference sponsored by the Portuguese chapter of EUROGRAPHICS (GPCG) has been held in 1998 at CCRC in Coimbra.
- The EUROGRAPHICS'98 conference has been held in Lisbon, Portugal. CCG was a co-organizer.
- The Graphics and Visualization Education Workshop (GVE), co-sponsored by EUROGRAPHICS and SIGGRAH, has been held in Coimbra, July 1999. Co-chairpersons: Werner Hansmann, Mike McGrath and José Teixeira.

ing programs, for standardizations and training activities, for certifying and developing products, for the introduction and development of new technologies, for collaboration in the same fields with public and private bodies and participation in programs for the development and support of African, Latin-American and other countries, specially those of portuguese language.

During its first operating phase – from the foundation to its establishment at the University of Minho in 2001 – the Centro de Computação Gráfica realized a tremendous amount of R&DT work, playing a pivotal role in projects with great responsibility such as the »Virtual Oceanarium« (a virtual representation of the sea-life simulating the real Oceanarium at the Expo 98); the »Virtual Tour of Bracara Augusta« (a multimedia application for the presentation of the ancient Roman city Bracara Augusta) and the »Multimedia Record of Cabo Espichel«, to mention just a few, which contributed to CCG's reputation as a competent and experienced Association with national penetration.

In fact, in Portugal CCG has been a pioneer in developing state-of-the-art solutions like the application of Virtual Reality in the simulation of artificial animal life, the use of image processing and cooperative work in the field of Telemedicine, the recording of Cultural Heritage by means of Multimedia and Virtual Reality,

the development of intelligent tools for three-dimensional modeling of moulds and shapes for the shoemaking and moulding industries, respectively, or concerning the development of solutions in order to support Telework and Collaborative Work.

During a decade CCG has been a point of excellence for applied Computer Graphics in Portugal, by transferring into the country's technology know-how and technologies out of the INI-GraphicsNet, and by developing new solutions to create innovation in local and international partnerships.

A special reference is due to Prof. J. C. Teixeira, president of the Executive Board from the founda-



**Figure 3:** Meeting of the definition of the new mission and the decision on the revised constitution and bylaws for CCG, Coimbra, March 2001 (left to right (front): Prof. Dr. A. Marcos, CCG's Executive Director; Prof. Dr. J. L. Encarnação, Chairman of the Board of the ZGDV; Prof. Dr. C. Pereira, Rector, UM; and (right back) Prof. Dr. A. Machado, UM)

- CoopMedia2000, the 1st Portuguese Workshop on Cooperative and Distributed Multimedia Systems, sponsored by GPCG has been organized by CCG, having U. Minho - Dpt. Information Systems as co-organizer.

CCG has evolved from an initial budget of about 150000 Euro and a team of two members in 1994 to a budget of more than 1 Million Euro and a staff of 32 members in 2000.

Nowadays, after the restructuring act, CCG is redesigning its different models of operation, namely with the University, the INI-GraphicsNet and with its members and partners. We plan to improve the scientific quality of our project results through a close collaboration with the University of Minho and to explore in a more consequential way the intern partnerships within the INI-GraphicsNet through regular visits between the different points of the network.

CCG is a certified institution for Teaching and Training in Technology, and it also has a program of R&TD grants accredited by the portuguese Ministry of Science and Technology. This program has allowed CCG to set up a process for student exchange with the university.

**The new Mission and the Future**  
The restructuring of the CCG and its liaison with the University of Minho, through the establishment of its headquarters there, represents the implementation of a model that aims to combine and link the various scientific and technological competencies of the University in order to improve CCG's R&TD activities. This solution assures a strong academic link, profiting from the human resources and their scientific training and human resources with Master and Doctor's degrees. This excellent scientific »back-up« is the guarantee for a union of competencies that allows us to achieve an outstanding level in R&TD activities. The applied research, used for the development of solutions for business practice, that guides

**Figure 4: Signing the ZGDV-UM collaboration agreement on 21 April 2001, Braga (left to right: Dr. Manuel Ferreira, Braga's Vice-governor; Prof. Dr. Chainho Pereira, Rector, UM; Prof. Dr. J. L. Encarnação, President ZGDV)**



CCG, also implies a strong application of scientific methods.

The existing philosophy within the INI-GraphicsNet, based on the idea of sharing scientific knowledge, is passed on to the CCG Association. For the realization of their research projects, the team of national scientists can rely on information available from the INI-GraphicsNet, or at any other partner of the constituting members of this Foundation and institutional network.

Minho is clearly one of the most industrialized parts of Portugal, where large companies and family run businesses coexist. There is here a tremendous potential for technology transfer, coming directly from CCG or from all over the world through the INI-GraphicsNet, into local industry. We do

not need to develop again what has been successfully completed in one of the other members of the INI-GraphicsNet. We only need to adapt or to customize the solution to the local needs of one of our partners.

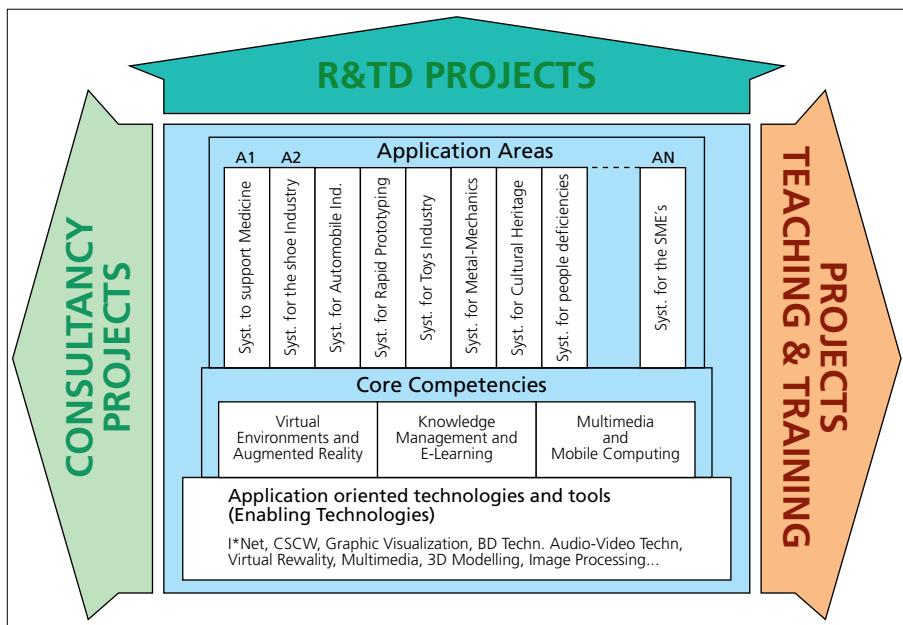
The development of prototypes and services within the CCG has its origin in two different lines of CCG's structure: the effective research and development work realized internally and the transfer of knowledge within its intra-institutional relationships.

Therefore, the Centro de Computação Gráfica adopts the following goals:

- to grow and to establish itself as THE national Institution for Research and Technology Development in the field of Computer Graphics and its Application,

**Figure 5: CCG's most recent Project: Virtual Show Case – applying Virtual and Augmented Reality for Visualisation of Cultural Heritage Exhibition Artefacts (Courtesy of IGD-Rostock)**





**Figure 6: R&DT Model of CCG.** The Fundamental Technology areas are the root for the development of R&D projects. The Scientific Kernel Areas represent the fields where CCG concentrates its R&D interests. The Application Areas – where the Technology Transfer projects occurs. A R&DT project may cover this three different levels of competencies

- initiating and establishing a model of applied research, strongly directed towards the final solution;
- to become the Hub of Technology Transfer for Portuguese Industry, promoting solutions by means of Computer Graphics and its Applications, and relying on the different competencies within the INI-GraphicsNet network;
- to become a Centre of Opportunity for Portuguese enterprises by promoting the exchange of knowledge and solutions between reality and national experiences, and the different national realities that are part of the INI-GraphicsNet network, especially Germany, United States of America and Asia (Singapore, Korea);
- to establish itself as the leader in the setting up of the Information Society in Portugal, by bringing the solutions of Computer Graphics to the common citizen thus playing a pivotal role in the process of democratization of access, production and understanding of information in general and promoting

therefore a society that is aware of today's possibilities;

- to establish itself as a Hub for Scientific and Technology Transfer from Portugal and the INI-GraphicsNet to the Portuguese-speaking countries in Africa and Brazil as well as Galicia, Spain.

In order to enforce national penetration – and besides the headquarters being located in Guimarães – the CCG maintains a Project Group in Coimbra and is establishing two new ones in the cities of Lisbon and Braga. CCG can potentially create a Project Group everywhere though there are locally basic conditions needed to acquire and execute R&DT projects. By keeping project groups in these three locations, CCG is now being represented all over Portugal.

The application oriented technologies and tools (Enabling Technologies) are the root for the development of R&D projects. The Scientific Core Competencies represent the fields where CCG concentrates its R&D interests. The Application Areas - where the Technology Transfer projects occurs.

A R&DT project may cover this three different levels of competencies.

Every Project Group has a development team and a leader, who embrace a specific R&TD field where its primary goal is to acquire local projects within its field of competencies. It can also assume the development of projects coming from other groups, which avoids a duplication of competencies within the national institution CCG.

This way, it is possible to cover geographically the entire country in order to promote Scientific and Technological Research in the field of Computer Graphics and its Applications, wherever and whenever necessary and finançable.

To complete the Restructuring Process, CCG together with the ZGDV/INI-GraphicsNet Foundation and some representative national partners are establishing a company that has as main objective to maximize the commercial exploitation of the CCG's and INI-GraphicsNet's prototypes and solutions within the Portuguese Market and Portuguese-speaking countries. The company will start operation during the second half of 2001, with headquarters in Lisbon and offices in Coimbra and Guimarães.

As part of the great INI-Graphics-Net family, we can look with certainty and confidence towards the future.

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