PROFILE

Mission and strategy

EDM has the ambition to be one of the leading international research institutes in the areas computer graphics, human-computer interaction and multimedia and communication technology. The strategic focus is placed on broadening the research spectrum and enhancing research valorization. EDM is established in 1994 as a joint effort by the Flemish Government, the ERDF, the province of Limburg and Hasselt University. It performs fundamental and applied research in computer science. In 2004, EDM became a partner in the IBBT.

Staff

Professors and guest professors:	dr. Eddy Flerackers (managing director), dr. Frank Van Reeth (group leader, deputy managing director), dr. Karin Coninx (group leader), dr. Wim Lamotte (group leader), dr. Philippe Bekaert, dr. Kris Luyten, dr. Chris Raymaekers, dr. ir. Luc Claesen (guest professor), dr. Fabian Di Fiore (guest professor), dr. Dirk Kenis (guest professor), dr. Jos Dumortier (guest professor)
Senior researchers:	dr. Johan Claes, dr. ir. Luc Claesen, Edith Cloes, Benny Daems, dr. Fabian Di Fiore, dr. Tom Mertens, dr. Peter Quax, dr. Jan Van den Bergh, Peter Vandoren, dr. Tom Van Laerhoven
Researchers and PhD students:	Stijn Agten, Petr Aksenov, Codruta Ancuti, Cosmin Ancuti, Anastasiia Beznosyk, Stef Cant, Tom Cuypers, Bert De Decker, Tom De Weyer, Jeroen Dierckx, Maarten Dumont, Yannick Francken, Karel Frederix, Kris Gabriëls, Patrick Goorts, Tom Haber, Mieke Haesen, Chris Hermans, Geert Houben, Panagiotis Issaris, Rohita Khatiwada, Danny Lathouwers, Jori Liesenborgs, Steven Maesen, Nasim Mahmud, Raf Menten, Jan Meskens, Andy Motten, Sofie Notelaers, Johan Nulens, Johanna Octavia, Dawid Ostrowski, Karel Robert, Sammy Rogmans, Deepak Sahni, Jan Schneider-Barnes, Jolien Schroyen, Niels Schroyen, Johannes Taelman, Daniël Teunkens, Davy Vanacken, Lode Vanacken, Cedric Vanaken, Geert Vanderhulst, Maarten Van Meer, Jo Vermeulen, Maarten Wijnants
Administrative and technical staff:	Luc Adriaens, Roger Claes, Ingrid Konings, Erwin Meekers

Key Figures 2009

Research budget: € 4.790.000
Researchers: 70
Technical and supportive staff: 4
Publications: 64
PhD theseses: 2

CONTACT

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EDM - Expertise Centre for Digital Media
HIGHLIGHTS 2009

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PREFACE

After five years of growth, the Expertise Centre for Digital Media (EDM) has been faced with a (minor) decline in its research staff in 2009, due to the economic recession. As companies and governments have less means to invest in research, the competition for research funding is getting fiercer. However, since every crisis is a prelude to a renewed start, shifting another gear up is the best guarantee to realize EDM's ambitions.

EDM participates in the Interdisciplinary Institute for Broadband Technology (IBBT), a Flemish strategic research institute. Its new structure, grouping research into thematic core departments, provides opportunities. It will enhance collaboration with the industry and allow for a stronger position in the European research community. We expect the IBBT to become even more successful in the coming years.

EDM participates in creating regional competence centers in co-operation with the European Regional Development Fund (ERDF) and regional partners. Its project RITCHIE enables the establishment of 'iDiscover'. This is an open knowledge center for the culture and heritage sector, focusing on the development and usability of mobile ICT technologies. The GameHUB-project targets the concentration of know-how on computer game design and technologies.

Given the growing impact of ICT, we welcome the graduation of the first students that completed the two-year master program in computer science. We were also delighted to witness the rise (nearly 50% growth) of the number of new bachelor students at Hasselt University.

ICT will keep providing new forms of communication, services and applications. With our research set on human-computer interaction, multimedia and communication technology and computer graphics, EDM should be well positioned for a new decade of ICT research.

Prof. dr. Eddy Flerackers
Managing director

HIGHLIGHTS 2009

Research projects

EDM has managed to obtain EU-funding for the FP7-ICT project FINE (Free-viewpoint Immersive Networked Experience). The international project consortium, uniting Spanish, German, Swedish and Belgian partners (the company EVS and EDM), will focus on researching and developing a novel end-to-end architecture for the creation and delivery of a new form of live media content.

The GameHUB-project, funded by EFRO/ERDF, has been granted in 2009 to a regional project consortium led by PHL, EDM being one of the main project partners. The GameHUB-project targets the concentration of know-how on computer game design and technologies. The project will also enhance collaboration with the gaming industry through research projects.

The establishment of an expertise centre on mobile ICT and cultural heritage in collaboration with the Provincial Gallo-Roman Museum (PGRM, Tongeren) illustrates the success of the EFRO/ERDF-project RITCHIE. The expertise centre, called iDiscover, has gradually disseminated the results of the previous ARCHIE project and mobile games. Various national and international players from the cultural heritage domain consulted the expertise centre for advice or guidance on the usage and implementation of IT at their cultural heritage site.

Linking research and education

The EDM faculty provided scientific guidance to more than twenty national and international PhD students. The majority of the 60 scientific publications appeared in scientific journals and in proceedings of international scientific conferences. Two PhD students, Cosmin Ancuti and Lode Vanacken, successfully defended their PhD theses in 2009.

The two-year master in computer science had its first graduated students in 2009. The master offers three graduation specializations: multimedia, databases and human-computer interaction. The latter is unique in Flanders. These specializations are linked to the research focus areas within the computer science department.
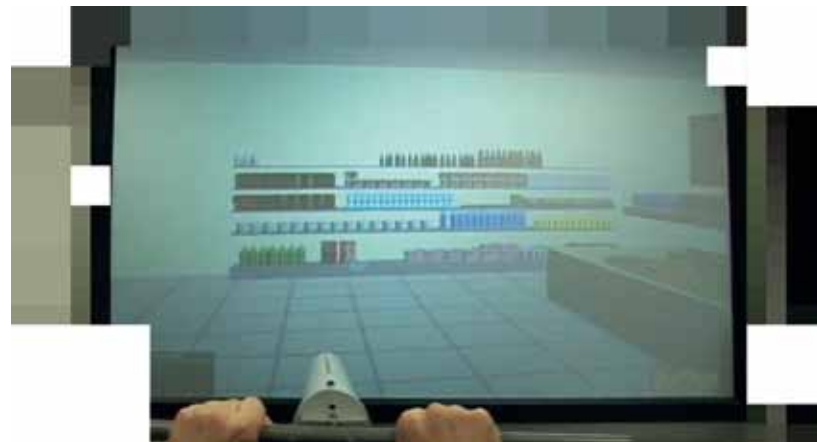
RESEARCH

Human-Computer Interaction

Research at EDM is concentrated in three key competence areas. Human-computer interaction is the largest research domain. Its first research line is **context-sensitive interactive systems**. It focuses on fundamental research of the use of models at design time and runtime. These context-aware interactive systems can adapt according to their environment, users, location. EDM also investigates support for developers on the level of software architectures for the realization of ubiquitous and pervasive interactive systems. The research regarding mobile location-based systems resulted in innovative mobile educational games supporting a museum visit.

Multimodal interaction in 3D and virtual environments has a focus on studies of interaction techniques that are enriched by haptics or audio. Interesting applications of haptics emerge in the rehabilitation of MS patients and support for segmentation of medical images. As the creation of virtual environments is a complex task, EDM investigates how the process can be facilitated using a model based approach.

The **interactive workspaces** research line emphasizes interaction with large surfaces, like multi-touch applications. The growing interest in multi-touch applications leads to the development of frameworks for the realization of these applications. New interaction techniques, exploiting the added value of multi-touch, are investigated in several application domains, including collaborative setups.

User-centered software engineering targets aspects of bridging the gap between user-centered design techniques and software engineering approaches and pays attentions to usability issues. Examples of topics in this domain are methodological and tool support for multidisciplinary teams using storyboards, and model-driven software engineering.

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Computer Graphics

Since its founding, computer graphics has been a key part of research at EDM. All of its sub-domains are present, in particular modeling, visualization and animation. **Modeling** is concerned with how 3D objects can be visualized and manipulated in a compact, efficient manner. It can be done manually and semi-automatically.

Visualization deals with image generation, starting from a model. The image can be indistinguishable from a photo, for instance for special effects in feature films or computer games. In other cases it is important that the visualization expresses something, for example for technical illustrations or drawings in cartoon style.

Animation involves the representation, manipulation and visualization of objects that are moving or are being transformed. EDM has much expertise in 2.5D-, physically based- and highly-stylized animation techniques.

Recently the emphasis has shifted in favor of **image- and video-based computer graphics**. This new branch of computer graphics starts from visual material filmed by synchronized digital video cameras and concentrates on achieving efficient manipulations. The advantage of this approach is the built-in level of realism. It is an expanded form of video or film that allows the manipulation of film material, such as removing or adding objects, manipulating material characteristics, interacting with objects.

Multimedia and Communication Technology

Multimedia and communication technology research is situated first of all in the domain of **networked virtual environments** (NVE). It provides people with a means of interacting with each other via the internet and broadband networks, within a graphical environment. EDM research is focused on several underlying technologies of NVEs and virtual interactive communities. The second domain in this research area are **interactive multimedia systems** where further research on offering innovative services to different target groups was performed. The research focuses on the user part, the required software modules and the interoperability between various back-offices.

VALORIZATION

Building on nearly two decades of applied research in co-operation with the industry and contract research for the industry, EDM is a **valued research partner** to small and medium enterprises and larger companies. The partnership with the application-oriented institute IBBT was also enabled by this vast experience.

Part of this success is due to the attention EDM has been paying to the possible **application of research in industry and society**. Only this mindset allows for the true establishment of a full research spectrum in a research institute. This spectrum approach is advantageous in performing research in itself and it has proven to be quite a powerful strategy in combination with the three, complementary research competence areas. This global research concept generates cross-fertilization and hence provides a much broader knowledge base for contract research and valorization.

The research strategy has led to the establishment **of several spin-off companies** in the past twenty years. The current spin-offs are software-oriented. Opportunities for additional spin-off companies are carefully evaluated, and have resulted in a grant of the Flemish IOF (Industrial Research Fund) in the fall of 2009 for additional research concerning a possibly new spin-off initiative.

As patents about specific software developments or inventions remain quite discussable, EDM has never really focused on obtaining patents in the past years. Given the growing importance of knowledge management and valorization, **two patent applications were filed** in 2008 at the European Patent Office and are currently awaiting approval.

All faculty professors, the marketing manager and a senior researcher, partly financed by the IOF, are daily active in the realization of the valorization strategy of EDM.