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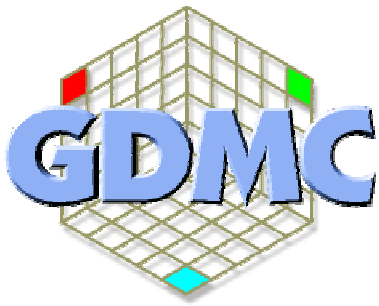
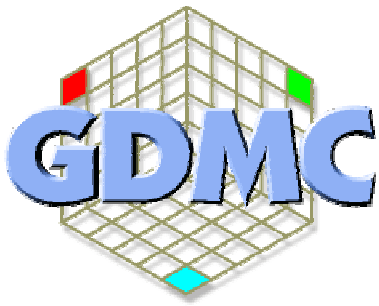


INTRODUCTION



On Wednesday 15 November 2000 the KvAG, section GIS organises the Java GIS seminar. The date of this Seminar is not a coincidence. On this day also GIS Day 2000 will be organised all over the world. Since 1987, the National Geographic Society has sponsored the Geography Awareness Week to promote geographic literacy in schools, communities, and organisations, with a focus on the education of children. More information can be found on www.gisdag.nl.

The seminar focuses on GIS. Especially Java technology based GIS techniques and applications are powerful tools, because of the fact that these techniques can be used on Internet.
The programme consists of presentations with a technical content delivered by experts from organisations, which play an outstanding role in the field of Java and/or GIS.

After the seminar the 'Geo-Database Management Center' (GDMC) will be opened officially by dr. C.J. Kroese, Member of the Board of Directors of the Dutch Cadastre.
The Geo-Database Management Center (GDMC) is the research and development center for Geo-Information technology of the Delft University of Technology.

The developments in the field of GIS technology are going very fast. The basis for this can be found in the ICT developments regarding Database Management Systems (DBMSs), (mobile) communication/Internet, computer graphics (Virtual/Augmented Reality), development of object oriented software (e.g. based on the Java platform) in general and specifically in the geographic area. For a university it is impossible to keep track of all these developments by its own and to anticipate on new developments as well. In order to become one of the five top universities in the world in the field of GIS Technology, it has been decided to follow the research model of the Geo-Database Management Center (GDMC) including participation of industry. The research programme concentrates on the theme geo-DBMS.

The GDMC is a research and development center for all activities related to the database modelling, storage, retrieval, analysis, presentation and distribution of geo-information. The GDMC is located at the Delft University of Technology, Department of Geodesy, Section GIS Technology (an OpenGIS member). Participation of other organisations and companies is actively pursued. At this moment the participants are Sun Microsystems, Oracle, Computer Associates (CA) and Professional Geo Systems (PGS).

PROGRAMME 7TH KVAG SEMINAR, SECTION GIS: JAVA GIS

15 NOVEMBER 2000
DEPARTMENT OF GEODESY
DELFT UNIVERSITY OF TECHNOLOGY

09.00-09.30 hours	Welcome - coffee
09.30-09.35 hours	**OPENING ON BEHALF OF THE KVAG** Peter van Oosterom, TU Delft
09.35-10.50 hours	**JAVA FOR GEOGRAPHICAL INFORMATION SYSTEMS** Chris Laffra, OTI
10.50-11.10 hours	Coffee break
11.10-11.50 hours	**ORACLE SERVER JAVA APPLIED TO SPATIAL DATA** Han Wammes, Oracle
11.50-12.30 hours	**SERVER AND CLIENT SIDE JAVA IN ARCIMS** Jeroen van Winden, ESRI
12.30-13.15 hours	Lunch
13.15-13.55 hours	**WEB ENABLING LOCATION BASED SOLUTIONS USING JAVA** Peter Rieks, MapInfo
13.55-14.35 hours	**DEVELOPING GIS BASED ON JAVA-1 OR JAVA-2?** Frank Tuijnman, PGS
14.35-15.15 hours	**DEVELOPMENT OF A 3D VIEWER IN JAVA** Rob Versseput, TNO NITG
15.15-15.30 hours	Coffee break
15.30-17.00 hours	**OFFICIAL OPENING GDMC**
17.00-18.00 hours	Reception/Happy Hour

ABSTRACTS JAVA GIS SEMINAR

- JAVA FOR GEOGRAPHICAL INFORMATION SYSTEMS
- ORACLE SERVER JAVA APPLIED TO SPATIAL DATA
- SERVER AND CLIENT SIDE JAVA IN ARCIMS
- WEB ENABLING LOCATION BASED SOLUTIONS USING JAVA
- DEVELOPING GIS BASED ON JAVA-1 OR JAVA-2?
- DEVELOPMENT OF A 3D VIEWER IN JAVA

JAVA FOR GEOGRAPHICAL INFORMATION SYSTEMS

CHRIS LAFFRA, OBJECT TECHNOLOGY INTERNATIONAL AG

ABSTRACT

GISs are moving more and more away from traditional desktop environments into handheld devices (PDAs and cell phones) and vehicles. These so-called "embedded" environments generally deploy conflicting operating system models. The fragmentation of embedded OSs and the distributed nature of mobile GIS systems make Java a natural choice. Java originally started as a language for mobile devices, but due to its size worked better on desktop size computer systems. More recently, the language and its runtime environments have gone through a couple of re-factoring stages. This has rendered Java deployment systems that comfortably run on a budget of, say, 200K. These two trends allow us to develop GISs in Java to be run on mobile devices.

In this presentation I will discuss various language issues, concentrating on embedded aspects (such as real-time behaviour, garbage collection, application packaging, access to legacy code, etc). Furthermore, we will explore application architecture possibilities (how does the GIS client connect to the rest of the world?).
Finally, we will touch on embedded Java design trade-offs (how can we make Java applications smaller, class library standardisation efforts, and application development issues -- versioning, team work, profiling, and debugging).

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ORACLE SERVER JAVA APPLIED TO SPATIAL DATA

HAN WAMMES, ORACLE NETHERLANDS

ABSTRACT

JAVA LOCATION SERVICES: THE NEW STANDARD FOR LOCATION-ENABLED E-BUSINESS
'Let's look at some of the challenges we all face in what is being called the "New Information Economy". Perhaps most dramatic are the forces of change that are driving the momentum of the New Information Economy. Disguised as lofty concepts like e-Commerce and e-Business, these forces are largely based upon underlying, key enabling technologies associated with the Net. The most important of these technologies today are Java™ and XML. Java is the language of the Net. XML is the new, flexible content delivery protocol for the Net. Java and XML technologies are good friends! Together they satisfy the needs for building industrial strength, cross-platform application service solutions for the Net.'*

A specific implementation of this is Oracle e-Location, which is based on Oracle9i Application Server Wireless Edition and Oracle Spatial. Underneath Oracle uses it's Java API to post and get (non-)spatial data through (Geo)XML, to provide proximity search, YP search, Mapping and Routing visualisation, etc. Mapping and Routing visualisation can be based on 3rd party tools like MapXtend from MapInfo or Autodesk OnSite or eg. SVG.

* Quote from Harry Niedzwiadek, Image Matters LLC on http://www.geojava.com, written on behalf of SUN, MapInfo and Oracle.

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SERVER AND CLIENT SIDE JAVA IN ARCIMS

JEROEN VAN WINDEN, ESRI NEDERLAND B.V.

ABSTRACT

ArcIMS is ESRI's solution for GIS on the Internet. ArcIMS is a fully scalable product for both the novice user as the experienced developer. In the product different solutions are added for server and client programming. The developer can choose from image and feature streaming. On both the client and the server side a developer can choose from so called connectors within an ActiveX, Coldfusion, Java or OpenGIS environment. All communication between client and server is in XML based ArcXML.

In the presentation the ArcIMS product, the underlying architecture, the available services, ArcXML, the Java Applets and the Java object model will be covered. The functionality available in the many different Java applets will be demonstrated. Both advantages and disadvantages of using the standard Java applets within ArcIMS will be mentioned. The different classes available in the first version of the Java Development Kit will be introduced in the presentation.

A short introduction of the Geography Network, a global geographic catalog service based on ArcIMS and OpenGIS, will conclude the presentation.

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WEB ENABLING LOCATION BASED SOLUTIONS USING JAVA

PETER RIEKS, MAPINFO LTD.

ABSTRACT

This paper discusses the transition from "traditional" GIS deployment to web-solutions and the importance of the technology advancements in the wireless Internet market. The push by Oracle to be the "IS of GIS" provides a strong foundation allowing decentralised and isolated GIS applications to be integrated into a standard-based and open architecture that benefits the customer. The popularity of the internet and the ease-of-use offered by mobile phones and other handheld "Internet-connected" devices now also provides for the first time an interface for the casual user being able to take advantage of location-based services. As expressed by the Meta Group "by 2003, more than 50% of all Internet access will be done by non-PCs". All-in-all, technologies and trends that provides a better ROI on the original investment into the GIS infrastructures in place today. Examples and demonstrations involving MapInfo Java-based Internet technologies, Oracle 8i Spatial and WAP/Palm support will be an integral part of this presentation.

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DEVELOPING GIS BASED ON JAVA-1 OR JAVA-2?

FRANK TUIJNMAN, PROFESSIONAL GEO SYSTEMS B.V.

ABSTRACT

Java consists of two, different versions: Java 1 (also called Java 1.1) and Java 2 (in the past also Java 1.2). These versions differ in functionality and also in availability. The browsers of Netscape and Microsoft include Java 1. Java 2 is only separately available as plug-in. This makes Jave-2 less appropriate as a client for pure Internet applications. However, it is an excellent tool for Intranet applications and via the server for Internet applications.

The presentation goes more deeply into the differences between both versions. Moreover the importance of Java for GIS applications will be highlighted.

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DEVELOPMENT OF A 3D VIEWER IN JAVA

ROB VERSSEPUT, TNO NITG

ABSTRACT

There is an increasing demand for advanced 3D visualisation of earth system data. This demand stems from a growing use of advanced 3D systems for observation, characterisation and dynamic modelling of terrestrial systems. The results of the workflows are in general digital 3D data that are only accessible by means of the advanced tools they were created by. This can hamper importantly the widespread of information to both experts as non experts.

This year TNO NITG started a Java 3D viewer project. The viewer will be used primarily to disseminate the digital map of the deep subsurface of Holland that is currently being made by the Department of Geo Energy at TNO NITG. However, it is hoped for that the viewer can play a role in the widespread of knowledge in other situations as well. Sustainable human activities often depend on the capacity of environmental or geological systems. In the decision making process, like town and country planning, a good understanding of the environmental and geological systems is therefore of paramount importance. This is clearly a situation in which non experts would benefit from the availability of an adequate visualisation tool for subsurface data. This is one of the reasons the viewer will be made available over the Internet for free.

It is expected that in future the functionality of the viewer will be enhanced to satisfy the specific visualisation needs of other departments as well.
The viewer will thus become a key factor in the dissemination of TNO NITG's results.

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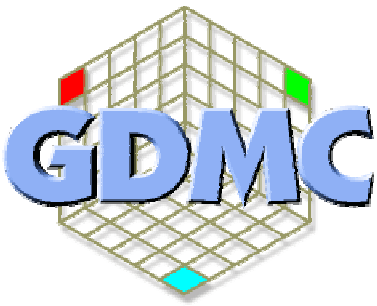
PROGRAMME OFFICIAL OPENING GDMC



15.30-15.35 hours **INTRODUCTION**
Theo Bogaerts, Chairman of the Department of Geodesy, TU Delft
Chairman of the Opening Session

15.35-15.40 hours **HOW IT ALL STARTED**
Bas Kok, Director of Ravi

15.40-16.10 hours **OVERVIEW OF THE GDMC**
Peter van Oosterom, Leader Section GIS Technology, TU Delft

16.10-16.15 hours **COMPUTER ASSOCIATES' MOTIVATION TO PARTICIPATE IN THE GDMC**
Jill Memmot, Academic Partner Programme Manager CA

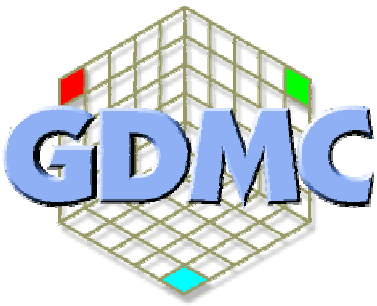
16.15-16.25 hours **ORACLE'S MOTIVATION TO PARTICIPATE IN THE GDMC**
Han Wammes, Oracle Netherlands

16.25-16.30 hours **TU DELFT HOSTING THE GDMC RESEARCH**
Henk-Jan Overbeek, Dean of the Faculty of Civil Engineering and Geosciences, TU Delft

16.30-17.00 hours **OFFICIAL OPENING**
Kees Kroese, Member of the Board of Directors of the Dutch Cadastre

17.00-18.00 hours Reception/happy hour

GEO-DATABASE MANAGEMENT CENTER



The Geo-Database Management Center (GDMC) is the research and development center for Geo-Information technology of the Delft University of Technology.

GIS TECHNOLOGY FOR THE GEO-INFORMATION INFRASTRUCTURE

Why working with partners?
The developments in the field of GIS technology are going very fast. The basis for this can be found in the ICT developments regarding Database Management Systems (DBMSs), (mobile) communication/Internet, computer graphics (Virtual/Augmented Reality), development of object oriented software (e.g. based on the Java platform) in general and specifically in the geographic area. For a university it is impossible to keep track of all these developments by its own and to anticipate on new developments as well. In order to become one of the five top universities in the world in the field of GIS Technology, it has been decided to follow the research model of the Geo-Database Management Center (GDMC) including participation of industry. The research programme concentrates on the theme geo-DBMS.
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Motivation of the organisational set-up
The research objective of the Section GIS Technology is to support the realisation of the Geo-Information Infrastructure (GII) in a technological sense. Internationally the GII is sometimes also called the SDI (Spatial Data Infrastructure). In this respect the GIS tools can be considered as the principle research objectives. The GII provides a better access of geo-information and facilitates the use by more organisations/individuals, who deal with spatial problems in one way or the other:

- What is the quickest route to go from A to B taking into account this morning's heavy traffic on the highway?
- What is the best method for a municipality to open up its zoning plans internally and externally (citizens, private companies)?
- What is the nearest restaurant, service station, etc. taking in to account my current location?
- Which owners have to be notified by the Telecom Company about the construction of a new cable connection?
- How looks the landscape after the realisation of a new railway?

- Which cables and pipes should be taken into account during the excavation at this location?

All these questions have in common that they need one or more geo-information sources to give the right answer. Often it is not realistic to collect the data for each question (application) by oneself or to buy these data covering the whole area at a geo-information source. However, shared use on the basis of a shared infrastructure, makes it realistic to use geo-information. Groups of users making use of the same information and exchanging information are called information communities.

From GIS to GII via OpenGIS
Geographic Information Systems (GIS) are used within (local, regional, central) governments, utility and other companies to support their core business, which often depends heavily on spatially referenced data. Until recently the spatial data management has been handled by GIS software outside the DBMS. As DBMSs are being spatially enabled, more and more GIS packages are or will soon migrate towards an integrated architecture: all data (spatial and thematic) are stored in the DBMS. This marks an important step forward that took many years of awareness creation and subsequent system development. Due to more and more exchange of geo-information within and between organisations, the need for a Geo-Information Infrastructure is also growing. The Geo-Information Infrastructure consists of three, rather different basic components: geo-data sets, geo-data processing services (geo-DBMS) and interoperability standards. Each of these components of the GII holds many aspects: organisational, financial, technical, etc. The research of the GDMC will focus mainly on the technical aspects of geo-data processing services and the corresponding interoperability standards in general and the OpenGIS standards in particular. By setting up (geo-)information communities it becomes possible to have a direct, controlled access to geo-data at the source. The GII can replace, in the long run, the exchange of copies of data sets between organisations.

What includes the GDMC exactly?
The GDMC includes the research activities of (the staff members and students within) the Section GIS Technology. Besides there exists an intensive co-operation with the Faculty of Information Technology and Systems resulting in an active participation of a number of students of this Faculty in the GDMC. Staff members of the participants from the industry form the last group of the 'occupants'. The GDMC is located at the Department of Geodesy and consists of a number of laboratories: the '3D GIS and VR' lab, the 'database' lab and the students' computer room. An important aspect of the GDMC is the web site, which can be found on http://www.gdmc.nl. Besides providing all kinds of information, a part of the research itself is carried out via this web site, e.g. 'distribution of geo-information via Internet'. The importance of the geo-DBMS is increasing at the transition to the GII, because not only one organisation depends on it, but the (geo-)information community as a whole. Therefore a consistent research programme has been formulated concentrating on the central theme of geo-DBMS. The research in the field of geo-DBMS forms a good basis and takes care of coherence between the different projects. All projects belong to one or more of the following four main research areas:
1. Quality/semantics of geo-information
2. 3D GIS and Virtual/Augmented Reality (VR/AR)
3. Distribution of geo-information via Internet and
4. Modelling of dynamic processes

Types of geo-DBMS research at the GDMC
- Testing performance and functionality (spatial indexing and clustering)
- Research and development of DBMS extensions for geo-data, e.g. 3D types and operators
- Research of complex spatial features (topology)

- Support of temporal aspects (spatio-temporal models)
- Generalisation within the geo-DBMS
- Fundamental support of the quality of geo-data (based on specific data types)
- Testing of VLM databases for GIS applications
- Realisation of Internet GIS applications based on geo-DBMS
- Linking of VR/AR applications (based on a limited scene size in a VR/AR environment)

Actual research projects GDMC (between brackets the parties involved are mentioned)

- Internet GIS cartography (Municipality of Tilburg)
- GML prototype Top10vector (together with Alterra/ITC for the Dutch Topographic Service)
- Integration of 3D GIS and Virtual Reality (Karma, LWI project)
- 3D urban model for the purpose of Augment Reality (TU Delft - DIOC Ubicom)
- 3D cadastral registration (Dutch Cadastre)
- Distribution of geo-information via the Internet (TU Delft - DIOC Betade, Province of Gelderland)
- Testing performance and functionality of Oracle 8i spatial (Dutch Cadastre)
- Building classification for the real estate index (Dutch Cadastre)
- Object DBMS technology for complex spatial objects and operations (internal)
- Investigating optimal generalisation implementations: at server of client side (University of Wuhan)
- 3D spatial objects and operators based on the tetrahedron model (internal)
- Investigating optimal raster data (earth observation) storage: in files or geo-DBMS (internal)
- Mobile GIS for the purpose of tourist applications (internal/CMG/ANWB)

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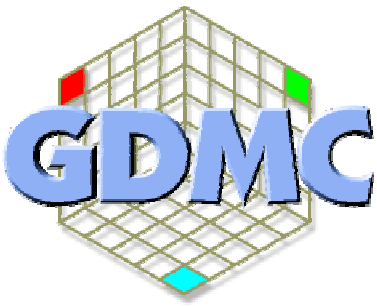
POSTER PRESENTATIONS



- MOTIVATION
- GEOGRAPHIC INFORMATION INFRASTRUCTURE
- DATABASE TECHNOLOGY
- METADATA
- INTERNET GIS
- TOP10VECTOR PROTOTYPE
- 3D CADASTRAL REGISTRATION SYSTEM
- OPEN GIS
- MANAGEMENT OF RASTER DATA IN A DBMS
- MOBILE GIS
- 3D MODELLING