Proposal to host the 16th International Conference on Discrete Geometry for Computer Imagery

Nancy - April 2011

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1 Preliminaries

It will be an honour for us to host the 16th edition in Nancy and this document describes our proposal to host the DGCI conference on April 2011.

With its three Universities and its ten engineering schools, Nancy is an important city for study (more than 40 000 students), for research and to organize scientific events. The conference would take place in the LORIA laboratory, the computer science laboratory of Nancy. LORIA is directed by Karl Tombre and is composed of more than 450 individuals including

- more than 150 researchers and teaching-researchers
- a third of doctorate students and post-doctorate
- engineers, technicians and administrative staffs

organized in research teams and research support services.

All the members of the organizing committee are members of the ADAGIo team (five permanent members) of the LORIA, created in January 2006, whose main research area is Discrete Algorithmic and Discrete Geometry. Since the 4th edition of DGCI (Grenoble France), the organizing committee members have always attended the conference with many publications and they have taken part to the Reviewing Committee of several editions of DGCI.

The first sections are devoted to a presentation of Nancy and the LORIA laboratory. Then, we give details on the scientific and financial aspects of this proposal.

Nancy

2 Access

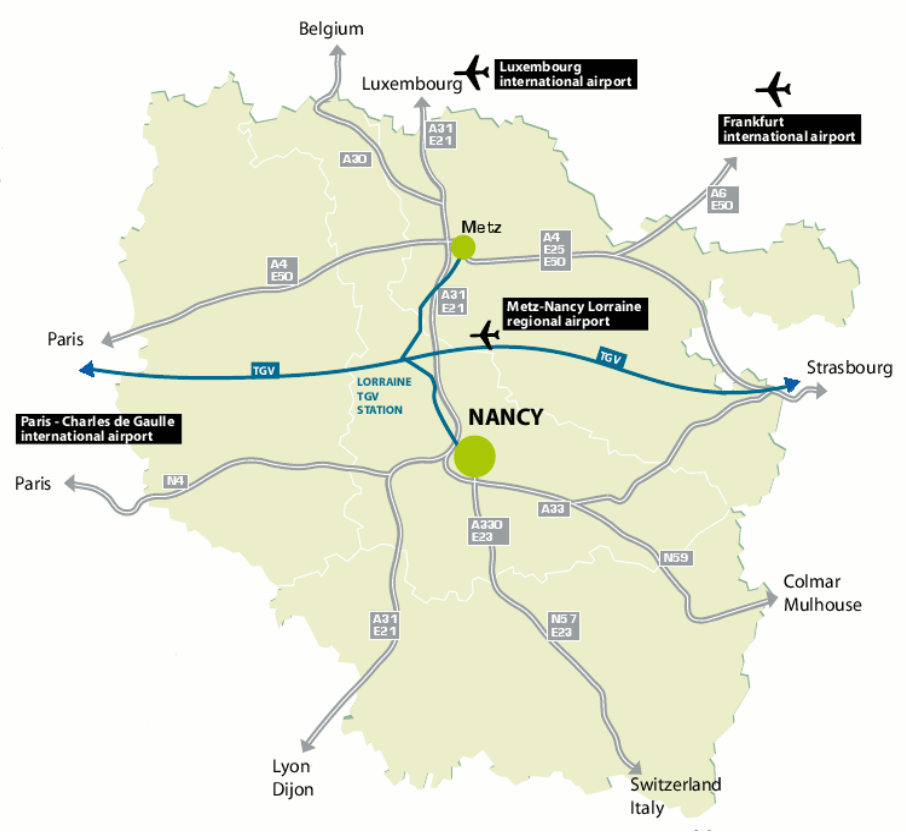
2.1 By air

The closest major international airports to Nancy, offering regular flights to destinations all over the world, are situated in **Luxembourg** (116 km), **Frankfurt** (285 km) and **Paris – Charles de Gaulle** (350 km). The TGV (fast train) offers a regular high speed service from Paris-Charles de Gaulle airport to the Nancy-Lorraine station (journey time approx. 1hr 10mn).

The **Metz-Nancy- Lorraine regional airport** (40 km north of Nancy on the A31 motorway) also offers regular flights to several cities in France and Europe (see http://www.metz-nancy-lorraine.aeroport.fr). A frequent shuttle bus runs to and from Nancy (timetables on the Airport website).

2.2 By rail

Major national and European railroads cross the Lorraine region, giving easy access to all major European cities. Nancy is located just **1hr 30mn** from Paris city centre with the TGV high-speed link, which offers **10 daily return services between Nancy and Paris**.



2.3 By road

The major North-South and East-West roadways cross the Lorraine region and provide connections to all other European countries.
The **A4-E50 motorway** connects Paris to Nancy, Strasbourg, Stuttgart, Berlin and Vienna.
The **A31-E25 motorway**, which crosses Europe from North to South, allows a direct connection from Brussels and Luxembourg to Barcelona or Milan, via Nancy, Lyon and Marseille.
The **N4 4-lane expressway** links Paris to Strasbourg via Nancy.

2.4 Public transportation

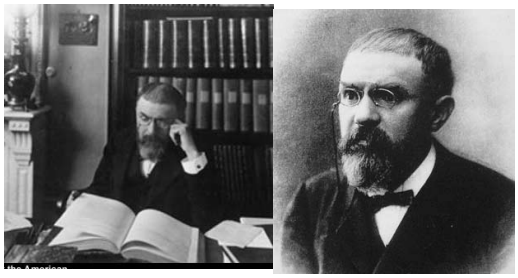
The building of the LORIA is located at the south of Nancy, between the communes of Vandoeuvre and Villers-lès-Nancy. This localisation makes it very accessible, by the road and by public transportation (T1 tramway line).

3 Nancy, a rich scientific history

3.1 Birthplace of Henri Poincaré

One of the world's most famous scientists, Jules Henri Poincaré (1854-1912) was born in the eastern French city of Nancy into an influential family. His father Léon Poincaré (1828-1892) was a professor of medicine at the University of Nancy. His younger sister Aline married the néo-Kantian philosopher Emile Boutroux. Another noted member of his family was his cousin Raymond Poincaré, President of France from 1913 to 1920.

Poincaré is one of France's most reknowned mathematicians, and contributed important works in physics, astronomy and philosophy of science. He is often described as a polymath, and in mathematics as "The Last Universalist".



Henri Poincaré

Poincaré contributed to mathematics, mathematical physics and celestial mechanics. He formulated the Poincaré conjecture, one of the most famous problems in mathematics, for which Grigori Perelman offered a solution four years ago. In his research on the threebody problem, Poincaré became the first person to describe a chaotic trajectory and is considered to be the founder of the field of algebraic topology.

Like Albert Einstein, Poincaré elevated the principle of relativity to a postulate in 1905; unlike Einstein, he retained the notion of a luminiferous ether (thus obviating the need for Einstein's light postulate). In addition, he characterized the Lie-algebra of the Lorentz group, and derived the first two Lorentz-covariant laws of gravitation. Along the way, Poincaré provided the four-vectors for Hermann Minkowski's four-dimensional spacetime theory (1908), but deplored the latter's Einsteinian view of space and time coordinates, advocating in its place an interpretative convention equivalent to the postulation of Galilean spacetime.

Poincaré often intervened in philosophical discussions and controversies concerning the foundations of science. His articles dedicated to the philosophy of science are gathered in 4 volumes: Science and Hypothesis (1902), The Value of Science (1905), Science and Method (1908) and Last Thoughts (1913). Considered to be the "father of conventionalism", Poincaré emphasized the creative role of scientists in coming to grips with reality.

Poincaré received many awards and honours throughout his professional career. He became a member of the "Académie Française" in 1908, and the Poincaré group used in physics and mathematics was named after him.

In tribute to this great mathematician, the Henri Poincaré Archives in Nancy has compiled a comprehensive collection of the "Poincaré correspondance", and Nancy's prestigious science and technology University also bears his name.

3.2 Other great names in Nancy's scientific history

Although Nancy's scientific history and reputation are most often associated with, and even dominated by, Poincaré, other names deserve to be mentioned.

In the field of mathematics, a prime example among numerous others would be Charles Hermite (1822-1901), who directed Poincaré's PhD. He was famous at the time for his work on elliptic functions and number theory, as well as for his influential position as an inspiring teacher at the Ecole Polytechnique, the Ecole Normale Supérieure and the Faculty of Sciences of Paris.

The Institut Elie Cartan

Bourbaki's "birthplace"

Nancy also provided France with two of its greatest mathematicians, Elie and Henri Cartan. Elie Cartan (1869-1951) was professor at the Faculty of Sciences of Nancy at the turn of the 20th Century and made important contributions in group theory and differential geometry. The Institute of Mathematics of Nancy is now named Institut Elie Cartan in his honour.

His son, Henri Cartan, was born in Nancy in 1904. He worked on algebraic topology but is also well-known as a founding member of the Bourbaki group, of which he was an active participant from the beginning in 1935. From a methodological point of view, he represents a totally non-Poincarean, anti-intuitionistic and pro-hilbertian way of doing and exposing mathematics.

3.3 The Stanislas Academy

The Stanislas Academy was founded by King Stanislas Leszczynski in 1750. Since then, the Academy has kept alive the spirit of its foundator, and has promoted science, literature, culture and enlightenment in Nancy and Lorraine. Prestigious names such as Montesquieu, Fontenelle, Buffon or Poincaré were members of the Academy.

4 Nancy, city of culture and history

4.1 A rich historical past

The Alsace-Lorraine area was a territorial entity created by the German Empire in 1871 after the annexation of most of Alsace and parts of Lorraine in the Franco-Prussian War. The Alsatian part lay in the Rhine Valley on the west bank of the Rhine River and on the east of the Vosges Mountains. The Lorraine section was in the upper Moselle valley to the north of the Vosges Mountains.

The region became part of Eastern Francia in 921 during the reign of King Louis the German, later becoming part of the Holy Roman Empire. It was gradually annexed by the Kingdom of France after the Peace of Westphalia in 1648. After the Franco-Prussian War, the Treaty of Frankfurt returned the area to German control as part of the newly-created German Empire in 1871. A short-lived independence after World War I was ended by French troops in 1918 and the Treaty of Versailles of 1919, and the territory was returned to France. The area was annexed by Nazi Germany in 1940, but reverted to French control in 1945 at the end of World War II and has remained a part of France since.

The Battle of Nancy

Porte de la Craffe

The vivid historical past of the city of Nancy itself is closely linked to that of Lorraine, and was punctuated not only by battles and territorial conflict, but also by dazzling periods of artistic and architectural splendour.

Nancy's central geographical location was instrumental in shaping the history of the city, which became capital of the Duchy of Lorraine in the 12th century. After being burned to the ground by Emperor Frederick II in the 13th century, the city was totally rebuilt in stone over the next few centuries as it grew in importance. The struggle between the rulers of Armagnac and Burgundy shook the region, but René II, Duke of Lorraine finally defeated and killed Charles the Bold, Duke of Burgundy in the Battle of Nancy in 1477.

Nancy's history has always been associated with architectural and artistic excellence. This particularly applies to the city's development during the 16th century when a new town featuring a grid of straight streets was built adjoining the existing old town. The arts bloomed thanks to the presence of exceptional artists such as Jacques Callot, Claude Deruet, Jacques de Bellange, Georges de la Tour, and Lorraine gradually emerged as one of the most opulent and dazzling courts of Europe.

Jean Lamou wrought iron railings

Statue of Stanislas

Porte Héré

In 1737, Stanislas Leszczynski, former King of Poland, became Duke of Lorraine and led Nancy foreward into the age of Enlightenment. He ordered the construction of a magnificent series of squares which were constructed between 1752 and 1756 by a brilliant team led by the architect Emmanuel Héré. This architectural ensemble is today the city's main architectural landmark and forms part of the Unesco World Heritage List. It is made up of three city squares «place Stanislas" (considered one of the most beautiful squares in Europe, with its magnificent golden wrought iron railings designed by Jean Lamour), "place de la Carrière» and «place d'Alliance". Together, they bring to life the characteristic features and sentiments of this splendid era.

With the death of Duke Stanislas in 1766, the duchy became a French province. In 1831, an impressive statue of Stanislas was erected in the centre of the square which bears his name.

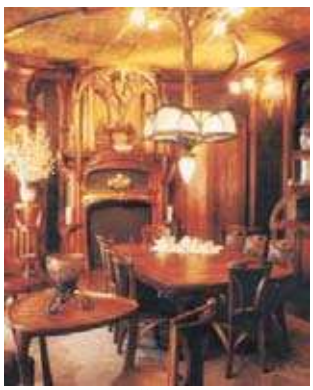
It was only after 1871 that a time of renewed growth began to manifest itself. The city of Nancy, renowned for its former royal court, began to evolve into an economic and industrial metropolitan centre, and in 1909 a famous International Exhibition was held here.

The turn of the 20th century witnessed the birth of the «Ecole de Nancy» which became a leading light of the Art Nouveau movement. The avantgarde design and expression of Ecole de Nancy artists such as Emile Gallé, Antonin Daum, Louis Majorelle, Victor Prouvé and Eugène Vallin, continue to enjoy influence in the modern art world.

During the First World War, Nancy was heavily bombarded and suffered much material damage. The Second World War saw the occupation by Nazi Germany, from which Nancy was freed by the American army in September 1944.

Emile Gallé

Daum vase



19th C. Majorelle Furniture

4.2 A hive of cultural and leisure activity

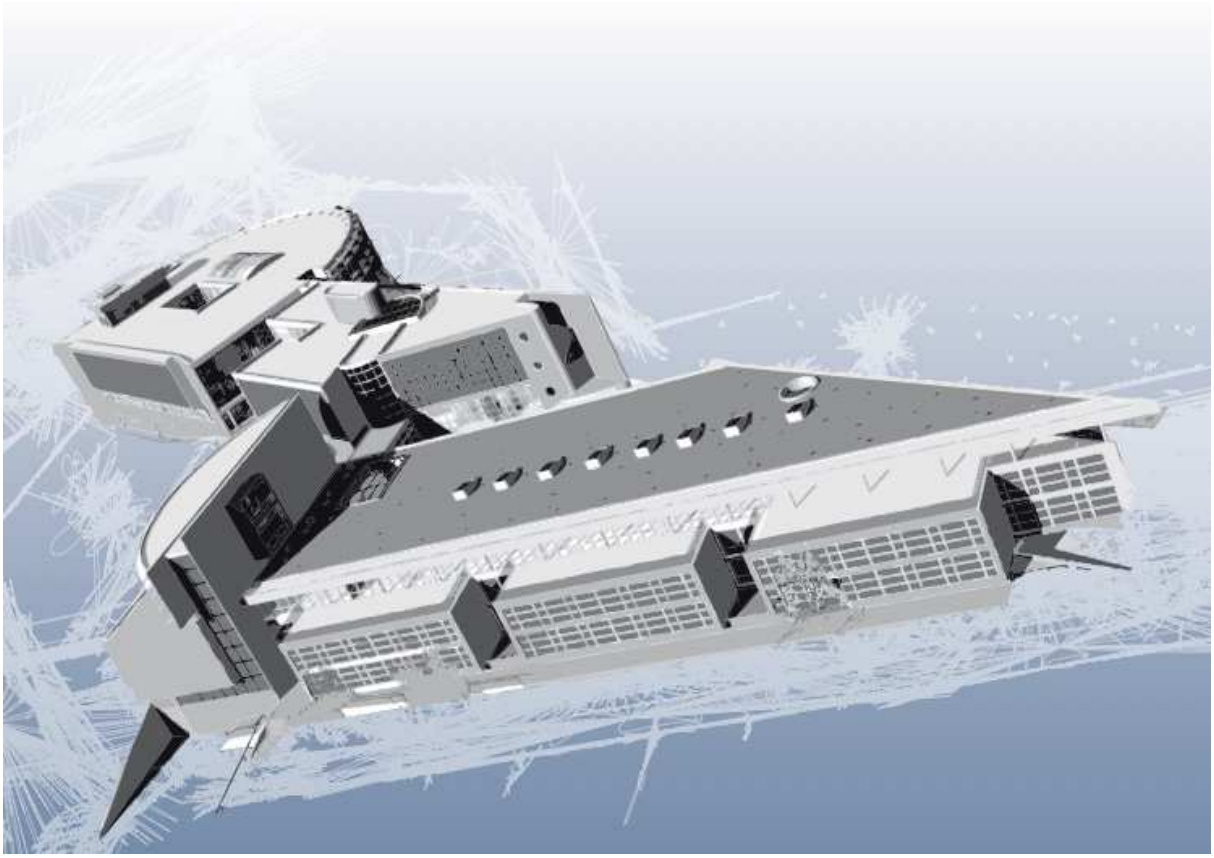
The city of Nancy boasts a number of prestigious museums including the *Musée des Beaux-Arts*, the *Musée Lorrain* and the *Musée de l'Ecole de Nancy*.

Internationally-reputed for the quality of their productions, the Lorraine Regional Opera House, the Nancy National Ballet, the Grand Theatre and the National Dramatic Arts centre form an outstanding cultural hub.

Greater Nancy is also equipped with first rate concert halls such as the Zenith (6,000 indoor capacity and 25,000 outdoors) and the majestic Poirel Auditorium. And for aficionados of the big screen, Greater Nancy is home to 6 cinemas, including 2 multiplexes and art house cinemas (8,444 seats).

All year long, exhibitions, shows, concerts, festivals and many other events take place in Nancy. For example, the annual Nancy Jazz Pulsations festival in October attracts major international names in jazz, blues and soul music. Top literary event of the academic year, the Livre sur la Place book fair is held in Place Stanislas and offers an overview of the latest in literature, along with exhibits, conferences and opportunities to meet confirmed and budding authors. The international choir singing festival, held every 2 years, brings together 2,000 choir singers and performing troups from nearly 50 different countries to perform in Greater Nancy

The Conference



5 The LORIA Laboratory

http://www.loria.fr

5.1 Presentation

The Lorraine research center in computer science and its applications (LORIA) is a research unit (UMR 7503) common to CNRS (French National Scientific Research Center), INRIA (French National Institute for Research in Computer Science and Control), and the 3 Universities of Nancy, gathered in the Nancy-University group: INPL, Henri Poincaré University (Nancy 1), and Nancy 2 University. LORIA conducts basic and applied research in the field of information and communication science and technology (ICST). It aims at being a center of excellence on both European and international levels that attracts the best, internationally competitive students and scientists.

LORIA's main scientific themes are the following:

- Automatic language and knowledge processing
- Reliability and security of computing systems
- Imaging and geometry
- Perception, action, cognition
- Cross-disciplinary theme: Computing and the life sciences

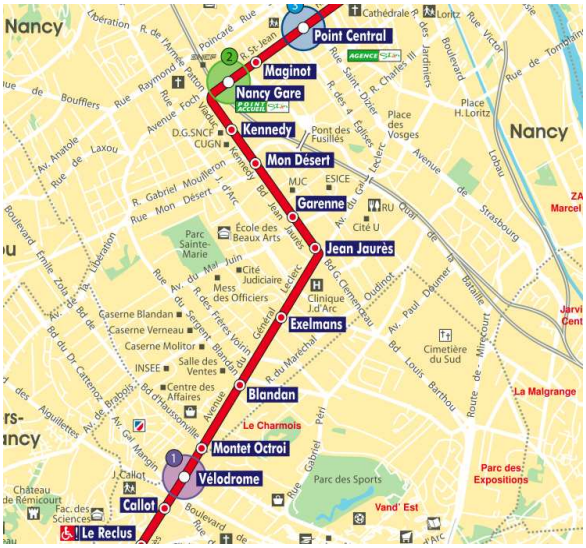
All the members of the proposal belong to the ADAGIo team which belongs to the third scientific theme. The main objective of this team is to develop efficient algorithms on the discrete structures (such as graphs, words, trees, sets of points in a space, ...). The proposed solutions generally rely on theoretical studies of combinatory, geometrical and arithmetical properties of these structures. The preferred fields of applications of these works are bioinformatics and imagery. Moreover the team is implied since November 2006 in an ANR project called GEODIB in which the Discrete Geometry of noisy objects is studied. A particular attention is given to the development of experimental software based on the algorithms coming from our works.

5.2 Facilities

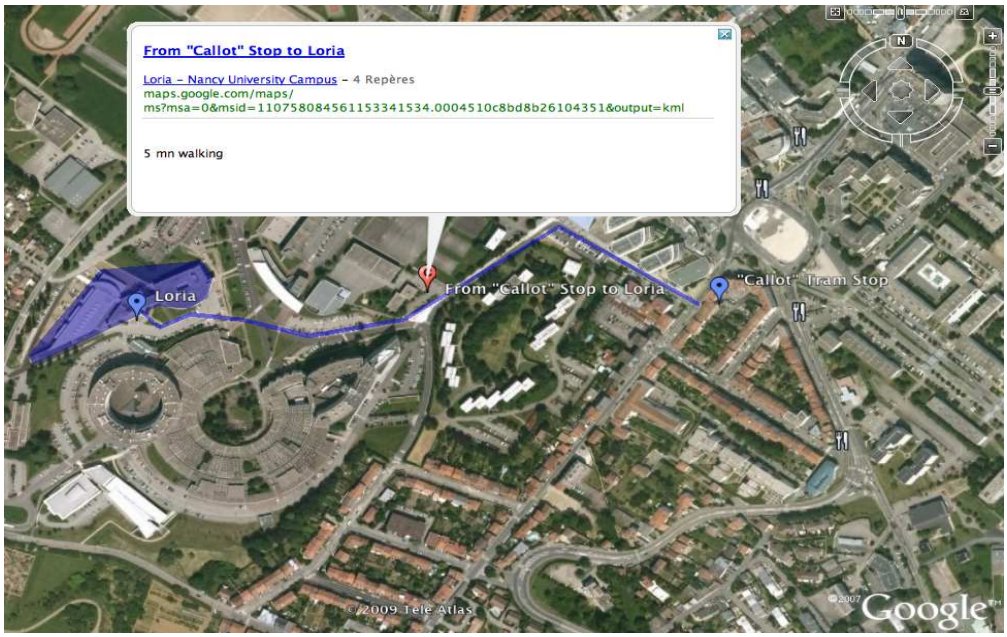
The LORIA offers all the necessary commodities you would expect from a modern laboratory building: a 240 seats amphitheater equipped with audio and video, various smaller classrooms from 20 up to 100 seats. Most of the building is covered by a WiFi wireless network and Ethernet is available almost everywhere with even some freely accessible outlets. This network is open for conferences and events. A room for the persons without computer will be available during the conference. The LORIA has a strong experience at hosting conferences and international events.

6 Accommodation and venue

The city of Nancy offers an important choice of accommodation (see http://www.ot-nancy.fr). Even if no negotiation has been done yet with hotels, we will propose a list containing different hotels recommended by the LORIA (with prices from 32€ to 139€).



The LORIA is located at 5min walking from the "callot" stop of the T1 tramway.



7 Program outline

We plan to organize the conference from 6th to 8th of April 2011, before the period of spring holidays in France. These dates could evolve when we know information about other conferences in interaction with the topics of DGCI (IWCIA, ...)

We can then sketch the program as follows:

- Wednesday
  - 8h00 – 9h00: Registration and welcoming talk
  - 9h00 – 18h00: First conference day
  - in the evening: Visit of *Musée Lorrain* and cocktail (To be confirmed)
- Thursday
  - 9h00 – 18h00: Second conference day
  - in the evening: Conference Gala in the *Salon de l'hôtel de ville* located on the famous *Stanislas Place*
- Friday
  - 9h00 – 16h30: Third conference day
  - 16h30 : Farewell

Using this program we can estimate the number of oral presentations to 30 with 3 invited talks and a 2 hour poster session on Thursday afternoon (25 minutes for the oral presentation). As inaugurated for the first time at Lyon 2008, we plan to organize a "fast tracks" session in order to present very quickly the content of the posters. A condensate presentation of 5 minutes using 2 or 3 slides will be allowed to the authors to present their poster to the whole of the participants. Obviously all these figures would be adapted according to the article selection process.

Among the conference program, slots will be scheduled for the Steering Committee meeting or the TC18 meeting.

8 Scientific policy

8.1 DGCI topics

According to previous editions and upon recommendations of the Steering Committee, we consider the classical **DGCI topics**:

- **Models for Discrete Geometry (grids, discrete objects, discrete model properties, digitization schemes, metrics,...)**
- **Discrete and Combinatorial Topology**
- **Geometric Transforms (image mappings, distance transformation, skeletons and medial axis,...)**
- **Discrete Shape Representation, Recognition and Analysis**
- **Discrete Tomography**
- **Morphological Analysis**
- **Discrete Modelling and Visualization**
- **Discrete and Combinatorial Tools for Image Segmentation and Analysis**

The **IAPR support** is requested through the association of this conference with the Technical Committee 18 on Discrete Geometry.

8.2 Submission and review process

Concerning the overall process, the submission of full papers will be reviewed by the DGCI Reviewing Committee and selected for either oral or poster presentation.

More precisely, we expect to follow the reviewing process used at the 14th DGCI :

- Each Program Committee (PC) member is in charge of one DGCI topic.
- Each Reviewing Committee (RC) member is "labeled" with one or more topic.
- The choice of reviewers for a given paper will be made with the PC member in charge of the main topic of the paper, among a list of specialists for this topic.
- In case of contradiction between the two original reviewers of a given paper or in case of problem with one reviewer, the PC member in charge of the main topic of the paper is involved.

The technical aspects of this process will be managed by the *ConfTool* system (used since the 12th edition). According to the Steering Committee recommendations, blind submission and reviews may be considered. The final decision step will be done by the Program Chairs with help from the Steering Committee.

8.3 Proceedings and special issues

We plan to publish the proceedings with Springer-Verlag in the LNCS series. Negotiations should be carried out with journals concerning special issues with extended versions of high ranked papers. Possible journals include *Discrete Applied Mathematics*, *Graphical Models*, *Image and Vision Computing* or *Pattern Recognition*. Again, the Steering Committee advices would guide us in this choice.

8.4 Invited speakers

The invited speaker list should be decided in coordination with the Steering Committee, several options should be investigated and we just address here a first thought:

- **Image Analysis: Nicole Vincent (Paris Descartes University, France)**
- **Discrete optimization: Nimrod Megiddo (IBM, Almaden Research Corporation, USA)**

9 Social Program

9.1 Visit at the Lorraine Museum

We plan to offer a cocktail party at the Lorraine Museum followed by a guided visit of the Musem.

The Museum has works representative of the artistic and cultural life of the region. Objects in daily use, weapons from different civilisations: prehistoric, Gallo-Roman, and Merovingian, are

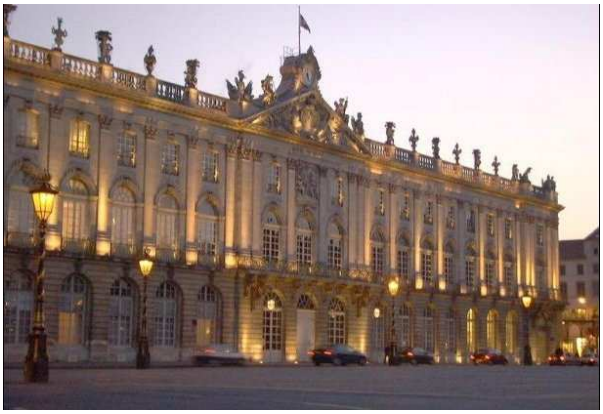
fascinating examples of this life, as are items from the Middle Ages and a number of beautiful religious and funerary sculptures. High points of Renaissance Art include works by Ligier Richier (in the Franciscan Church), and an important collection of stained glass windows and sculptures, as for example *Christ in the Garden of Olives*. Georges de La Tour's paintings and Jacques Callot's prints are set off by other magnificent works produced during Stanislas reign. The Museum's

exhibition of regional 18th and 19thC faïence is a collection by which others should be judged. The special collections on show in the museum include a gallery of miniatures and two galleries devoted to Jewish religious objects. Daily life in Lorraine, from the end of the 18thC to the beginning of the 20thC, can be seen in popular arts and crafts and in the ethnographic collection in the Franciscan Convent: regional furniture, popular faïence and household items shown in highly evocative, traditional Lorraine interiors.

In 1850, the Lorraine Museum opened its first gallery to the public. Since then the Museum has grown significantly, offering an exhibition area of 4,500m2 today spread over several outstanding buildings in the heart of the Old City; the Dukes' Palace, built by the Dukes of Lorraine, a fine example of early Renaissance architecture in eastern France, the 16thC Franciscan Convent and Church with tombs of the Lorraine family in its crypt...

9.2 Conference banquet

The conference banquet will be served in the "grand salon" of the City Hall on the "Place Stanislas".



The City Hall (Hôtel de Ville) is part of Nancy's magnificent architectural heritage, and as part of he famous Place Stanislas built in 1755 by Emmanuel Héré, features on UNESCO's world heritage list. The building's splendid halls and salons offer the perfect location for receptions.

10 Local organisation

10.1 Program Chairs (alphabetical order)

Five permanent members of the ADAGIo team of the LORIA are proposed to be Program Chairs. The main research area of the ADAGIo team is the Discrete Geometry and these five members regularly publish in conferences in this area (DGCI, IWCIA, …).

- **Isabelle Debled-Rennesson**
  - Associate Professor, Henri Poincaré University, Nancy,
  - Head of the ADAGIo team since January 2006,
  - Phd degree in Computer Science in 1995 at the University of Strasbourg and HDR (*Habilitation à Diriger des Recherches)* in 2007,
  - Member of DGCI's PC since the 12th edition (2005) in Poitiers and member of IWCIA's PC for10th, 11th and 13th editions.

- **Eric Domenjoud**
  - Full-time research position (*Chargé de recherche CNRS*) at the LORIA Laboratory,
  - Phd degree in Computer Science in 1991 at the University of Nancy,
  - Member of DGCI's RC since the 13th edition (2006) in Szeged.

- **Philippe Even**
  - Full Professor, Henri Poincaré University, Nancy,
  - Phd degree in Computer Science in 1989 at the University of Rennes and HDR (*Habilitation à Diriger des Recherches)* in 2000,
  - R&D engineer at CEA during ten years,
  - Member of DGCI's RC for the 15th edition (2009) in Montreal.

- **Damien Jamet**
    - Associate Professor, Henri Poincaré University, Nancy,
    - Phd degree in Computer Science in 2005 at the University of Montpellier,
    - Member of DGCI's RC since the 12th edition (2005) in Poitiers.

- **Bertrand Kerautret**
    - Associate Professor, Henri Poincaré University, Nancy,
    - Phd degree in Computer Science in 2004 at the University of Bordeaux,
    - Member of the Local Organizing Committee of the 10th edition of DGCI (2002) in Bordeaux,
    - Member of DGCI's RC since the 12th edition (2005) in Poitiers.

The structure of the Program chairs should be fixed according to the Steering Committee.

10.2 Local Organizing Committee

- **Members of ADAGIo team**

  All the members of the ADAGIo team will be involved in the organization of the event in relation with **Anne-Lise Charbonnier of the Conference Department** of the LORIA (see below).

- **Conference Department of the LORIA**

  Anne-Lise Charbonnier is head of this department. It is in charge of the administrative, financial and material organization of the conferences, workshops and schools. More precisely:
    - **Budget**: Preparation of the budget , budget forecast: incomes and expenses and final budget
    - Sponsoring and subsidies : request …
    - **Registration management** (website, payment, registration invoices, …)
    - **Management of expenses and receipts** (meals, proceedings, material, rooms renting…)
    - **Relations with projects** and departments, with the accounting agency and with a number of suppliers (restaurants, transport companies, hotel keepers, room renting organizations, etc.),
    - **Organization** of lunches, coffee breaks, gala dinner, reception, excursion, poster sessions…
    - **Contact with suppliers** (supplies, meals, etc.), requests for estimates, rooms renting…
    - **Invited speakers**: contact and travel organization

- Preparation of programs, posters, badges…
- **Reception** of the participants and the invited speakers

11 Financial plan

The main objective for the financial aspects of the conference is to balance incomes and expenses. According to the previous DGCI editions, we base our financial plan on 80-100 participants with a participation fee between 160 and 240 euros (with a special fee for students and IAPR members if the IAPR supports the conference). The table details the financial plan which is quite stable according to the number of participants and balanced between 80 and 100 persons.

The registration fee includes: the proceedings, the lunches, the museum visit with cocktail and the conference gala. The possible registration fees are resumed in the table below:

	Early Registration € VAT Included	**Late Registration** € VAT Included
Regular	240,00 €	270,00 €
IAPR Member	225,00 €	240,00 €
student	160,00 €	185,00 €
Extra banquet ticket for extra person	70,00 €	70,00 €

The possible sponsors are:

- The three Universities of Nancy : Henri Poincaré University, Nancy 2 University, INPL
- GDR IM (Groupe de Travail Informatique Mathématique)
- MESR (Ministère de l'Enseignement Supérieur et de la Recherche)
- The City of Nancy
- Conseil général
- Région Lorraine
- CUGN (Communauté Urbaine du Grand Nancy)
- ...

# Participants	80	100

Registration fee	14655	18519
Sponsors	14400	14400
SubTotal	29055	32919
Conference Hall	2000	2000
Proceedings (~ 50 /ex. + 10 extra)	4750	5500
Lunches (~10 /p /lunch)	2550	3000
Bags, notebook,... (~5 /p)	400	500
Coffee breaks (~5/p /break)	2550	3000
Gala (~55/p)	4400	5500
Gala room location	2000	2000
Invited speakers (~3*1000)	3000	3000
Museum	1000	1000
Cocktail museum	1200	1425
IAPR (20/p)	1600	2000
Posters	250	250
Organisation -Conference department	3500	3500
SubTotal	29200	32675

Total	-145	244

12 Schedule and deadlines

Based on the hypothesis that the conference will be held on 6-8 April 2011:

- First announcement, theme presentation, call for papers, web site: beginning of May 2010
- Second announcement and call for papers with the presentation of invited speakers: beginning of June 2010
- Submission: beginning of September 2010
- Notification: beginning of December 2010
- Camera ready: beginning of January 2011
- Conference: 6-8 April 2011