



Università degli Studi di Milano

Laboratorio di Informatica Musicale



# Quick Survey

Dean: prof. Goffredo Haus

# Research Topics

- Formal methods for music information coding and processing
- Audio DSP techniques for co/decoding and streaming
- Audio DSP techniques in the compressed domain
- Human/computer interaction within audio, music, & multimedia applications
- Measures of audio quality perception
- Design and development of music and multimedia databases
- Digitizing and preserving technologies for large music and multimedia archives
- Query methods by means of music audio and score cross contents
- Study and experimentation of techniques for coding, processing, compressing, preserving, and broadcasting of audio and music information

# Recent Applicative Projects

- **Teatro alla Scala, Milan:** digitalization of the score and audio archives, scientific supervision of the information technology projects concerning all the archives and the website (1996 - current)
- **Bolshoi Theatre, Moscow:** digitalization of the music archive (2001-2002)
- **Ministry of Cultural Heritages, Italy:** digitization projects implementation, software technologies and applications (with many third parties such as BMG Ricordi, Discoteca di Stato, Finsiel, etc.) (2005 - current)
- **Microsoft Research, Cambridge:** advanced human/computer interfaces for music mobile devices (with large human subjective evaluation)
- **GN Resound, Milan:** research about the quality of audio perception (with large human subjective evaluation)
- **SCF - Società Consortile Fonografici, Milan:** consulting for DBMS and metadata specification and development (current)
- **National Museum of Science & Technology “Leonardo da Vinci”, Milan:** design and realization of the new hi-tech audio area (2003-2004)

# Current Industrial Partners

- Accenture
- Assintel
- BMG Ricordi
- Discoteca di Stato Italiana
- EMI Music Italy
- Finsiel
- GN Resound
- Hewlett-Packard
- Mediaset
- Microsoft Research
- Ministero dei Beni e delle Attività Culturali
- Oracle
- RAI
- SCF - Società Consortile Fonografici
- ST Microelectronics
- TDK Europe

# International Working Groups

- IEEE CS TCCGM

Computer Society Technical Committee on Computer Generated Music Goffredo Haus, vice-chair; [http://www.computer.org/tab/cgm/tc\\_cgm.htm](http://www.computer.org/tab/cgm/tc_cgm.htm)

- IEEE Standards Association Working Group on “**XML Musical Application**”

Goffredo Haus, official reporter; PAR 1599 <http://standards.ieee.org/board/nes/1000-1999.html>

# **Future applications based on LIM proprietary technologies**

**Automatic symbolic codes (i.e. XML, NIFF, MIDI, MPEG4 SASL, ...) extraction from audio signals (i.e. PCM CD-DA, MP3) and graphic score files (i.e. TIFF, ...)**

**Automatic links synthesis between digital audio (i.e. PCM CD-DA, MP3) and score codes at many granularity levels (i.e. notes, bars, themes, pages, timing)**

**Automatic generation of thematic indexes extracted from digital audio and music scores for music database applications**

**Digital Audio Signal Processing in the Compressed Domain**

# Education

**STCM - three years graduation course on Musical Application of ICT (120 new students approx per year)**

**DCRIS - one year master course on Digitizing, Preserving, & Restoring Multimedia Information & Related Magneto-Optical Storage Media (15 new students approx per year)**

**TSPPSM - one year master course on Sound Designing and Production for Multimedia Applications (20 new students approx per year)**

**LIM - graduation thesis on music application of ICT (20 students approx per year)**