Memorandum of Understanding

For the implementation of a European Concerted Research Action designated as

COST 287

"Con-GAS, Gesture Controlled Audio Systems "

The Signatories to this Memorandum of Understanding, declaring their common intention to participate in the Concerted Action referred to above and described in the Technical Annex to the Memorandum, have reached the following understanding:

1. The Action will be carried out in accordance with the provisions of the document COST 400/01 "Rules and Procedures for Implementing COST Actions", the contents of which the Signatories are fully aware of.

2. The main objective of the Action is to significantly contribute to the advancement of the development of different gesture data analysis and capture/actuation aspects connected to the control of digital sound and music processing.

3. The economic dimension of the activities carried out under the Action has been estimated, on the basis of information available during the planning of the Action, at Euro 5.5 Million in 2002 prices.

4. The Memorandum of Understanding will take effect on being signed by at least five Signatories.

5. The Memorandum of Understanding will remain in force for a period of four years, calculated from the date of first meeting of the Management Committee unless the duration of the Action is modified according to the provisions of Chapter 6 of the document referred to in Point 1 above.

COST 287 - **ConGAS**
"Gesture Controlled Audio Systems"

A. Background

Gesture is a wide speculation topic in human-machine interaction research but it has rarely been studied in depth in systems that involve art and especially digital music. Audio systems (including Digital sound synthesis and processing) are a wide field in which the control aspect still needs to be studied and to be linked with scientific investigation upon gesture.

In fact, since real-time digital signal processing has become a reality for many digital sound effects (including sophisticated ones), an increased knowledge of gestural devices and their interaction with digital sound effects is now necessary: the control of digital audio systems by gesture goes in that direction.

From another point of view, the emergence of new types of interfaces and technologies, including wireless devices, touch-weight-pressure sensitive devices, virtual reality interfaces, force-feedback devices, etc., new types of human computer interfaces are being provided to enhance and supplement the keyboard/slider/potentiometer controllers usually considered for digital sound production, getting closer to the wide variety of means and I/O modalities found in traditional music instruments.

The overall goal of such systems is to enhance the naturalness of human-computer interaction through more cognitive and intuitive interfaces in a field like digital sound production that requires an amount of communication precision and detail which is not usual in other Human-Computer Interaction (HCI) systems. This poses several challenges to the design and control of interaction between systems and humans where sound production is involved.

Summing up, the control of sounds using gestural devices goes in two directions: on one hand it recovers a several centuries-long tradition tied to instrumental playing which proved to be extremely rich in nuance and detail while on the other it improves a new way to use machines to interact with sounds: it is more direct and natural, and it opens new and unexplored industrial possibilities.

The industry of digital musical instruments and devices is well developed in Europe (particularly so in Italy, France, Germany and United Kingdom); however, devices taken into consideration by this industrial field do not go much farther than keyboards and sliders. Extra-European industries (particularly north-American and Japanese) do reserve deeper attention to different control and gesture schemes for digital sound devices.

This contrast with the fact that fundamental research in this field is quite advanced in Europe and has very few serious competitors outside of the European Community. European countries provide a strong community in the gesture analysis and control field (cf. the *Gesture Workshops* organized in Bielefeld (Germany - 1997), Gif-sur-Yvette (France - 1999), London (UK - 2001) and Genova (Italy - 2003) which is starting to show in the later workshops a stronger attention to musical gesture) and they are now producing conferences and meetings (e.g. the *New Instruments and Musical Expression* (NIME) Conferences held in Dublin 2002 and Montréal 2003, or the *Musical Gesture Workshop* held in Firenze in 2001) which are completely dedicated to musical gesture and control issues.

The European research community is also strong in emotion analysis (cf. the *KANSEI - The Technology of Emotion* [10] workshop organized in Genova in 1997) which has shown from the start the greatest attention to musical gesture and interfaces. A good percentage of the research and investigation is conducted in European Countries.

The contrasting situation between research and industry in Europe is probably connected to a fundamental lack of dissemination and technology transfer strategies between the two communities in Europe in this field. It should also be mentioned that many of the results that this research will provide may prove to be useful in other fields such as HCI, Virtual Reality (VR), etc.
Furthermore, full exploitation of the possibilities offered by new gestural technologies and algorithms is possible only by setting up a team which collects the best European efforts currently available.

This project is conducted under a COST framework for several reasons, among which:

- it is an emerging subject of research which will benefit from advances in other fields (such as HCI, Digital Signal Processing (DSP), etc.); in particular, considerable attention is given to other COST actions in the TIST domain, such as Cost269 (*User Aspects of ICTs*) or COST 278 (*Spoken Language Interaction in Telecommunication*) COST 276 (*Information and Knowledge Management for Integrated Media Communication Systems*), COST 219ter (*Accessibility for All to Services and Terminals for Next Generation Networks*) and similar, and to research being carried out in the VR domain; actions will be taken to establish interactions and relationships with such activities;
- it is a complex multi-disciplinary field which encompasses a strong scientific and technical side which does indeed include several kinds of communication, intelligent interaction, cognitive aspects, experimental psychology (related to gesture emotion, intention analysis and to esthetic cognitive processes) augmented with humanistic studies related

to music; communication of all these aspects happens through sound; however, the peculiarity of this communication is that messaging is esthetic rather than semantic (i.e. it cannot be coded in a unique and unambiguous way); this trans-disciplinary approach should be considered as a plus in a context like telecommunication where intelligent interaction and cognitive aspects are ever more relevant[1] ;

- this field of investigation is at an initial stage which requires the coordination of the best European research towards a common effort; it is probably not yet mature for specific focused target projects: rather, a concertation of national research efforts is in order to give a definite thrust to European creativity in this domain;
- the ensuing necessary broadness and flexibility of participation to permit and deploy a fully interdisciplinary approach through a large number of participating countries and to allow later inclusion of activities not foreseen during the preparation of the action proposal.

B. Objectives and benefits

B.1 Objectives

The main objective of this COST Action is to significantly contribute to the advancement of the development of different gesture data analysis and capture/actuation aspects connected to the control of digital sound and music processing.

The objective can be detailed as follows:

1. **To establish links with connected fields of research.**

   One of the main goals of this Action will be to provide the community of musical gesture research and investigation with solid and permanent links to domains like:
   - Multi-modal interface research;
   - Smart user interfaces (e.g. ergonomic aspects, cognitive behavior, etc.);
   - Smart sensors/actuators for multimedia presence/interaction;
   - Intelligent interfaces for elderly and disabled, including rehabilitation technologies for all;
   - Human interaction in virtual, augmented and mixed-reality environments;
   - Virtual environment for visually or otherwise impaired people (feedback through synthesized sound, depending on distance, approaching/departing objects, etc.);
   - Haptic devices and technologies;

[1] It should also be noticed that this cross-breeding of different aspects has a solid tradition in European institutions (cf.Sub-section B.1, for a list of research centers).

- KANSEI-Emotion analysis groups;
- including academic and industrial research to widen the scope of the action itself from the point of view of the exploitation of results.

In establishing these links, this COST Action endeavour to have an impact on societal domains other than just the music field, such as:

- tool research for assistance to visual/motion or otherwise impaired people;
- ergonomic research in common mass tools and utilities;
- research in the field of acoustic ecology;

2. To improve the knowledge in the relationship between sound and gesture

This improvement will be carried out both on the mathematical/scientific side and on practical implementations. From this point of view, this Action will:

- provide a taxonomy of gesture typologies and definitions (expanding the now-classical ones, cf. [8,15,9]);
- provide new algorithms for gesture analysis capture and control;
- provide new algorithms for audio effects control and management;
- carry out new kinds of experiments to increase the knowledge in this field;
- thoroughly test several implementations for different sensors/actuators and devices (such as standard analog-to-MIDI[2] converters, modified data gloves, multiple Degrees-Of-Freedom (DOFs) haptic devices, etc.).

These steps will lead to common research and development platforms (both hardware/software) which would lead to better diffusion/reuse of knowledge;

3. To provide new gestural processing of sound.

The study of the reaction of the sounds to a gesture will lead to a more sophisticated way to process sounds. The typical structure of musical/instrumental gesture (division between control and sound production, audio feedback, haptic feedback and visual cues, and sound production) will be carefully studied and extended to lead to more natural uses of effects;

4. To explore distributed interactive multimedia technologies.

A survey of multi-platform and multi-operating-system integrations using networking protocols and technologies (cf. Section C. on p.8) is in order. A study/survey will be carried out on networking issues (e.g. protocols,

[2] MIDI stands for *Musical Instrument Digital Interface*, cf. [3]

latency, Quality of Service (QoS) etc.) for the application of distributed integrated performances for local-area as well as wide-area performer-performer interactions and performer-listener/audience transmissions, promoting the development of distributed collaborative performances;

5. To coordinate most prominent efforts at European level in this field.

Currently, several European research centers are working separately in this field. This is due to the diverse nature of their institutional framework; there are:

- classical research centers;
- multidisciplinary activity centers which do perform a great deal of research and experimentation in this field,;
- independent artist/researcher groups which do provide a great deal of creativity/innovation in this domain.

6. Promote the developments and applications of new technologies.

The Action will promote further development of interactive installation and distributed collaborative arts. Besides new applications and opportunities to explore new markets (e.g. interactive installation for museum,public places and new artistic performances) provided by its development, this COST Action will widen participation of music making and stage performance, and alternative paths to musical creativity and expressivity for many people, including those for whom conventional instruments are not an option due to physical constraints;

The Action aims to coordinate the different research realities in European countries to share and cross-fertilize their experiences. The use of common freely available programming languages (such as *Octave*[3] for abstract algorithm behavior validation, *Pure Data-PD* for real-time interaction and synthesis), *EyesWeb* for video capture and expression analysis etc.) and of open source common platforms (e.g. PC/Powermac architectures running low-latency mission-critical *GNU/Linux* kernels) will provide the necessary openness and strong internal compactness to this action. Generic gesture-oriented experimental devices such as STEIM's *SensorLab* (cf. http: //www.steim.nl/sensor.html), the *Polhemus FastTrack* (cf. http: //www.polhemus.com/home.htm), Max Mathews' *Radio Baton* may be used to implement new gestural devices encompassing a considerable number of gesture sensing/capture typologies. Other devices may include modified off-the-shelf devices such as Mattel's *PowerGlove* or Microsoft's *DrivingWheel* or experimental devices designed from scratch to suit particular instrumental needs;

[3] *Octave* is a drop-in full Free Software replacement for *Matlab* (http: //www.octave.org)

B.2 Benefits

The benefits can be summarized as follows:

A widespread sharing of information.

Researchers will be able to discuss their work with other specialists working in the same field. This is a unique opportunity offered by this Action;

A contribution to specific industrial realms:
music, television, radio, movies.

While the digital music instruments industry is the most natural recipient of technology transfers from this domain, other contributions may be envisioned in other fields. New interactive television and radio programs may soon need new gestural interfaces and sensors which may well derive by the research carried out in this field. Furthermore, new home theater scenarios, perhaps the largest and still growing mass entertainment industry where DVDs with larger and larger interactive sessions now play a fundamental role, may take due advantage from the results of the research carried out in musical gesture analysis and devices;

An improvement of the European role in this field.

As mentioned in Section A. (p.2), there is currently a fundamental lack of dissemination and technology transfer strategies which do not correctly position the European research in the state-of-the-art position it deserves. This Action aims to contribute to solve this problem promoting the collaboration of European teams between them;

A tool for industry.

Nowadays computers play a fundamental role in every field of industry. This COST Action is obviously directed and related to musical applications, and as such the immediate recipient of results of the related research is the musical instrument industry. With the advances in multimedia personal computing, the European industry is very quickly growing to mass marketing numbers which can compete at planetary level (for example, cf. *Creamware Gmbh* http: //www.creamware.de, *Steinberg Gmbh* http: //www.steinberg.net or *GeneralMusic S.p.A* http: //www.generalmusic.com/eng/index.htm) and it is actively looking for edge research in music related fields. However, industrial re-use of know-how developed through this COST Action may go well beyond the music industry: multimedia devices, multimodal interfaces and gesture-controlled systems are involved in very different environments which may range from home entertainment and multimedia performances to automotive applications (cf. for example http: //www.crf.it/uk/home.htm) to human and robot control of complex industrial processes - to innovative household appliances (cf. for example the Ambient-Agoras projec]) to mobile telecommunication commodities. In fact, significant signs of interest come from multimedia industries which are currently investing in research centers devoted to music and gesture (cf. the *Sony-CSL*

Laboratories http: //www.csl.sony.fr/Research/Topics/Music/index.html in France as an example);

A tool for education.

It is a known fact that gestural devices are becoming fundamental tools in computer assisted education environments. A look at IST i^3 (*iCube Intelligent Interactive Interfaces*) research projects, for example, will show that most of them do involve multimodal and multimedia gesture devices in educational contexts. This Action can provide useful conceptual and practical tools for general and music education assisted by computer technology.

C. Scientific Programme

The scientific programme of this COST Action will articulate itself along the following steps:

C.1. State-of-the-art investigation and refined specification of research planning within the Action itself.

This step is further articulated in:

- Gestural control taxonomy and classification, involving the following tasks:
  - (a) Interaction and performance control description and definition;
  - (b) Investigation on prior art techniques and algorithms for gesture-sound integration (mapping, etc).
- **Sound control definition and classification**;
- **Multimodal interface design classification (sensors, actuators, etc.),** possibly extending, generalizing and completing existing ones.

C.2. Establishment of design methods and techniques.

This step will involve:

(a) Study and design of a standardized common framework to investigate and describe the existing forms of gesture and sound control;

(b) Design and implementation of infrastructure software/hardware tools of the common framework (e.g. specialized plug-ins and libraries, experimental re-configurable sensing hardware, etc.);

(c) Implementation of new and also existing algorithms for sound control and for gesture-sound interaction in the established framework;

(d) Development of a common database for gesture algorithm description and implementation (this database should be freely accessible and the Action may accept external contributions to it).

C.3. Experimentation and Assessment of Design Methods and Tools.

This stage will involve the following steps:

(a) Development of software/hardware demonstration tools and vehicles for general and specialized public (to be used in conferences, fairs, exhibitions, etc.);
(b) Development of on-line demonstrators for download and experimentation;
(c) Production-grade software creation.

C.4. Establishment of Guidelines and Protocols.

This stage will provide a formalized documentation on the results obtained in the previous steps, in connection with - and possibly contributing to - several standardization efforts (such as *MIDI* protocol extensions -, the *Open Sound Control* protocol - OSC - http: //cnmat.cnmat.berkeley.edu/ICMC98/papers-html/OSC-kit.html, MIDI over IP protocol, the high-level MPEG standards - http: //www.iso.ch, i.e. *MPEG-4*, *MPEG-7* and *MPEG-21*, the *Spectral Data Interchange Format* - SDIF - http: //cnmat.cnmat.berkeley.edu/SDIF, etc.);

C.5. Dissemination and Diffusion.

Dissemination and Diffusion will be an ongoing activity during the whole duration of the Action. It will encompass the following activities:

- Organization of Working Group meetings dedicated to specific aspects and problems in the field;
- Organization of an international scientific conference every year devoted to Gestural control in Music; this conference may be coordinated with other related symposia, such as the Digital Audio Effects Conference - DAFx (which is the ongoing success of a now completed previous COST-G6 Action of the same name - cf. http: //echo.gaps.ssr.upm.es/COSTG6) or the *Gesture Workshop* (cf. http: //infomus.dist.unige.it/GW2003);
- Participation of the Action to special conference sessions in other international conferences, such as the International Computer Music Conference - ICMC cf. http: //www.icma.org, the above-mentioned DAFx conference (cf. http: //www.dafx.de), European symposia such as the Italian Colloquio di Informatica Musicale (cf. http: //www.xivcim.org), the French Journées d'Informatique Musicale (cf. http: //www.gmem.org/evenements/jim2002/jim.htm), etc.;

- Coordination and networking of scientific activities with the ongoing European projects in the field such as MEGA (cf. http: //www.megaproject.org), SOb (cf. http: //www.soundobject.org), AGNULA (cf. http: //www.agnula.org), CARE-HERE (cf. http: //www.bris.ac.uk/carehere), SHAPE (cf. http: //www.shape-dc.org), AMBIENT-AGORAS (cf. http: //www.ambient-agoras.org), with the ongoing Research Training Networks (e.g. MOSART cf. http: //www.diku.dk/research-groups/musinf/mosart or the Interactive Music Network project http: //www.interactivemusicnetwork.org), the Music via Motion projects (cf. http: //www.kcng.org/mvm), or the upcoming related Networks of Excellence on the proposed FP6 EoI (e.g. MUSICS MUsic Science and technology, SSP Smart Sensory Perception and others), etc.

The scientific programme of this COST Action aims at an efficient cooperation of every interested research group. **Working Groups** have been designed so that each research group may participate according to its own background and interest. The Action will use common servers and repositories and Free Software groupware tools (such as *PHPGroupware* for generic data, *Mailman* for mailing lists and *CVS* for software and documentation development) to be able to share any information they wish to. The same information may be accessible from the outside world wherever appropriate.

D. Organisation

This COST Action includes the following project coordination organigramme:

Project Chairperson:	General coordination of the project, EC project contact
Secretariat:	Administration and coordination
Management Committee:	Action steering organism (up to 2 national delegates per member country)
Working Groups:	Scientific activities (cf. below)

Due to the strong interdisciplinarity of this Action, there will be 3 **Working Groups** (cf. below). Each WG will have a WG Coordinator who will report the work carried out by the WG to the Management Committee. The overall coordination and integration of the WGs will be kept by the Management Committee which will have among its tasks to organize one conference per year and up to two Management Committee meetings per year to keep track with the work of the different **Working Groups**.

The organigramme outlined above should cater for the extended variety of constituent functionalities of this COST Action at different levels such as:

- Scientific Activities;
- Action Management and Coordination.

In particular, the organization of the Action has been designed to integrate different components (gesture organization and taxonomy, sensors/actuators analysis and implementation, algorithm implementation, etc.) in order to create a coherent picture and system in this field. As such, particular attention will be given to:

- Application + functionality specification;
- System Factorization into sub-systems/components;
- Interface and connectivity between sub-systems/components;
- System modeling/simulation framework allowing for early system behavioral verification of expected user functionality;

- Structural system verification.

An important aim of the Action is to stimulate collaborations. Attempts will therefore be made, where needed, to grant individual research groups the opportunities to exchange researchers for short periods (Short Term Scientific Missions).

The planned **Working Groups** are:

WG1 Capture/Analysis methods and technologies.
(keys: Gesture control theory, Movement tracking, Intention/Emotion detection, Mapping strategies, Non-invasive measurements, etc.)

The activity of **WG1** focuses on compiling information and valuable resources (including bibliography, guidelines and standards) on hardware and software of sensing technologies, carrying out standardization work on gesture algorithm coding, surveys and comparative studies. Basic research will be included as well in these activities, promoting paper publication and dissemination.

WG2 Gesture Device Implementation.
(keys: Sensor/actuator-Computer interfaces, Force-feedback, haptic, visual feedback, etc.)

The activity of **WG2** focuses on collecting and compiling resources for the development and implementation of low-level hardware devices, perform benchmarks and measurements on both experimental and commercially available devices, etc. Hardware resources lists, guidelines and surveys will include experimental and commercially available sensor-to-(any digital format) devices and digitizers, and a wide range of sensors and actuators (e.g. bend, flex, pressure, touch, ultrasonic and many others). **WG2** also aims to survey sensing technologies using Computer Vision and pattern recognition techniques such as motion tracking and face tracking with live video, as well as multi sensory fusions;

WG3 Multidisciplinary Integrated Applications.
(keys: Musical systems, Control networks, installations, digital musical instruments, etc.)

The activity of **WG3** will focus on the integration of the work carried out in **WG1** and **WG2** producing concrete applications of low-level and sensing technologies, bringing together developments from arts and sciences in order to promote inter- and multidisciplinary integrations. It aims to investigate mapping strategies and trans-domain-mapping and control of creative activities from one creative domain to the other (e.g. movement to

audio), records and documents relevant activities and promote developments in this domain throughout Europe and beyond.

While this distribution of the scientific work will distribute tasks quite evenly among participating partners it will allow each partner to carry out its scientific activities along the whole project duration.

The **Working Groups** will strongly promote cooperation and the creation of scientific networks with other COST Actions, and in particular to related COST-TIST Actions such as COST 269 (*User Aspects of ICTs*), COST 278 (*Spoken Language Interaction in Telecommunication*), COST 276 (*Information and Knowledge Management for Integrated Media Communication Systems*), COST 219ter (*Accessibility for All to Services and Terminals for Next Generation Networks*) and with other related projects.

Cooperation with other countries will also be taken into consideration, in particular with Canada and U.S.A.

The results expected from the **Working Groups** can be summarized as follows:

- A database of reference white papers and general information concerning the different topics (including new articles and papers written expressly in the context of the Action);
- A data base of reference Free Software implementations (both non-real time and real-time) of analysis and control algorithms;
- A information knowledge-base for hardware devices (availability, technical sheets, protocols, etc.);
- A data base of Free Software applications which implement full systems, demonstrators, etc.;
- A final publication (book) with attached CD-ROM.

The Action will strive to make all the results mentioned above as public as possible by giving particular attention to licensing conditions of software applications and code, of technical specifications and of papers and articles. Preferred licensing solutions will be GNU/GPL (*General Public License*) for software and GNU/FDL (*Free Documentation License*) for documents, because these licenses have been thoroughly and successfully tested over the years.

E. Timetable

This Action will last 4 years. One International Conference and up to two Management Committee meetings a year are planned. **Working Groups** may meet several times a year according to their necessity and to budget. Management Committee meetings will be combined during conferences and **Working Group** meetings in order to optimize the use of available resources.

The Conferences will become a centralized research exchange point: they will collect works on the subject from all over the world and will provide a basic framework for research in the field.

Two Milestones have been provided:

> **After the first two years (M1).** Milestone **M1** will lead this COST Action to provide an encompassing and documented survey of sensor/actuator devices and gesture analysis/rendition algorithms;
>
> **At the end of the action (M2).** Milestone **M2** will provide a survey of scientific and musical applications of low-level and sensing technologies including mapping strategies and trans-domain-mapping.

The timetable is described in the diagram in Fig.1.

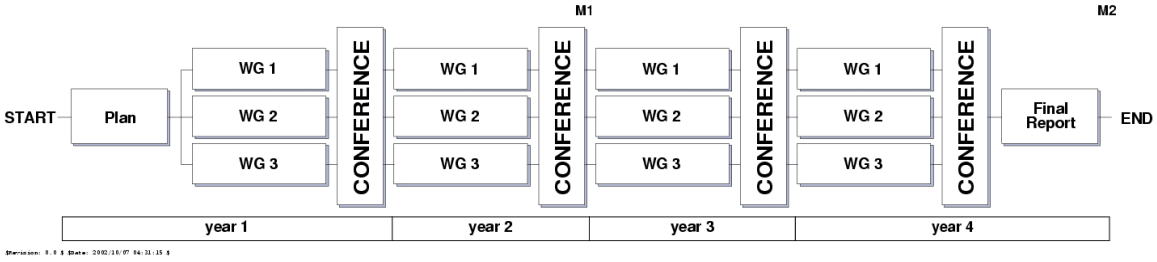

Figure 1: COST 287 development chart

F. Economic Dimension

The following COST countries have actively participated in the preparation of the Action or otherwise indicated their interest: Belgium, Finland, France, Germany, Ireland, Italy, Sweden, Norway, United Kingdom.

There are also ongoing contacts with research centers in Spain and in Switzerland. Interest to participation has been expressed by non-COST countries such as Canada. The consortium is also interested in extending itself over to Eastern European Countries.

On the basis of national estimates provided by the representatives of these countries, the economic dimension of the activities to be carried out under the Action has been estimated, in 2002 prices, at roughly Euro 5.5 million.
This estimate is valid under the assumption that all the countries mentioned above but no other countries will participate in the Action. Any departure from this will change the total cost accordingly.

G. Dissemination plan

This COST Action will ensure the dissemination of results and liaison with appropriate organizations and groups outside the Action.

The target audience for the dissemination is:

- industrial activities dealing with sound-oriented HCIs (musical instruments, telecom industries, games and multimedia industries, etc.);
- music gesture research labs, most of which are university hosted;
- end-users of digital music gesture devices (e.g. musicians, educators, art institutions, etc.).

The dissemination efforts and methods include:

- Organization of yearly COST 287 - **ConGAS** international conferences open to external participation;
- Presentation of Action achievements; at relevant international conferences;
- Distribution of publicly available COST Action reports;
- A COST 287 - **ConGAS** Action Website, regularly updated;
- A final publication with attached CD-ROM;
- Final report on the Website for public distribution.

In addition, this COST Action will aim at taking part in standardization bodies being relevant to the Action (cf. Section C. on p.8).

Wherever possible, the dissemination process and efforts will be a shared responsibility among all participants to this COST Action both at a national and at an international level. The dissemination plan, including efforts and methods, will be updated during the course of the Action in accordance with the results of the evaluation of the Action.

Additional Information

1. History of the proposal

Fundamentals of the ConGAS Action can be traced back up to a previous COST Action in the MISC domain, the COST *G6-DAFx* Action. This Action was devoted to the development, documentation and diffusion of knowledge in the field of audio digital processing. The *G6-DAFx*action (http: //echo.gaps.ssr.upm.es/COSTG6) ran from 1997 to 2001, and besides providing a great deal of informative knowledge on digital audio processing it clearly outlined the necessity of an in-depth study on control ergonomy, ranging from HCI to gesture analysis and extraction. The conferences (papers available at those addresses: DAFx98 http: //www.iua.upf.es/dafx98/, DAFx99 http: //notam.uio.no/dafx99/, DAFx00 http: //www.sci.univr.it/ dafx/, DAFx01 http: //www.csis.ul.ie/dafx01/, DAFX02 http: //www.dafx.de/) and **Working Groups** produced by the *G6-DAFx* Action often dealt with control and gesture - even though cursorily because of the off-topic nature of the argument. In April 2001, the Centro Tempo Reale (whose artistic director, Nicola Bernardini, was directly involved in the COST *G6-DAFx* Action) organized a workshop on digital audio control and gesture inviting the main European researchers in the field. That workshop produced the idea that a COST Action dedicated to these topics would be extremely effective in furthering the research in the field. The idea of this COST Action was born.

2. Preliminary work programme

To further improve the results outlined in this document an initial meeting will be organized. During this meeting the participants will discuss their role and their specific tasks into the project. After the meeting a specific document will be drafted: it will contain the detailed scheme of the project and the procedures for implementing the result.

3. Experts List

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