FP6-2004-NEST-PATH project no: 29085
CLOSED
Closing the Loop of Sound Evaluation and Design

Instrument: Specific Targeted Research Project (STREP)
Thematic priority: Strengthening the European Research Area

Deliverable 6.2 (part 2)
Project related publications

Start date of project: July 1st. 2006  Duration of the project: 36 months
Project coordinator name: Patrick Susini  Revision: 1
Project coordinator organization name: IRCAM

Kamil Adiloglu, Robert Annies, Klaus Obermayer, Hendrik Purwins (NIPG)
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1 Exploitable knowledge and its use

1.1 Overview table

<table>
<thead>
<tr>
<th>Exploitable Knowledge</th>
<th>Exploitable product(s) or measure(s)</th>
<th>Sector(s) of application</th>
<th>Timetable for commercial use</th>
<th>Patents or other IPR protection</th>
<th>Owner &amp; Other contractor involved</th>
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<tbody>
<tr>
<td>Physically-based sound models for everyday sounds</td>
<td>Sound Design, Tools (software package)</td>
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<td>No Plan</td>
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<td>UNIVERSONA</td>
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<td>Online Adaptive Parameter Optimisation</td>
<td>Sound Design</td>
<td>No Plan</td>
<td>No Patent</td>
<td>Owner: NIPG, Other contractors: ZHdK, VIPS</td>
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<td>Unknown</td>
<td>Copyright</td>
<td>ZHdK</td>
</tr>
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<td>EcoTile</td>
<td>Architectural components, VR equipment, Other (unknown)</td>
<td>Product design; Architecture; Art; Entertainment</td>
<td>2010-</td>
<td>Possible patent</td>
<td>Concept: Design: ZHdK and McGill University (Franinovic/Visell)</td>
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<tr>
<td>Adaptive Sounding Artifacts</td>
<td>Interactive sound producing products (various)</td>
<td>Product design; Sound design</td>
<td>Unknown</td>
<td>Further development required prior to patent</td>
<td>NIPG and ZHdK</td>
</tr>
</tbody>
</table>

1.2 Physically-based sound models for everyday sounds

**Description** The SDT package is envisaged to be exploited as a sound design tool for sound-augmented artefacts and everyday objects. The SDT package provides sound models which allows to simulate everyday sounds (e.g., impacts and frictions between solids, liquid drops and splashes). The sound synthesis models are physics-based, that is, they simulate interactions between physical objects that produce sounds. The models are made available as plugins for popular software platforms. The main advantage of the physics-based approach is that models are driven, and therefore can be controlled, by physically consistent and perceptually meaningful parameters. The SDT package provides a truly innovative approach to sound synthesis in that it allows to simulate non-musical sounds controlled by continuous interaction.

**Public target** A possible market can be that of software applications for (sound-) product designers. The increasing demand for quality of the sonic aspects of products and everyday environments is envisaged as a potential strong stimulus for research in sound interaction design, of which the SDT is an outstanding example.

**Stage of development** The current version of the SDT package is pre-final laboratory prototype (version 0.4.2c)

**License** SDT is free software that can be redistributed and/or modified under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or any later version. The official STD package distribution contains copy of the GNU General Public License in the files GPL.txt and GPL.mxt. Copyright (C) 2007-2008 VIPS group, University of Verona. Contact details: stefano.papetti@univr.it

1.3 Preference Based Learning

**Description** In a parametric design process - like SDT/UNIVERONA controlled with many parameters - designing the model is far from being enough for the success of the model alone. The parameters
should be tuned to be able to obtain the desired result. In such environments, parameter tuning is mostly done by hand by using the trial-error method. This can be a hard task.

In an online environment, this could be even harder, because the parameter tuning should be done in small number of iterations. *Adaptive optimization* is being developed to solve such parameter tuning problems.

In sound design, input parameter optimisation is again a crucial task to obtain the desired sound. The *adaptive optimization* method can be applied to sound design to make the parameter tuning task in a more structural way based on the user preference.

**Stage of development** The method is being developed by NIPG. It is planned to be ready by the end of the second reporting period. The demonstration of the method will be done in an adaptive bottle scenario. The adaptive bottle is an artefact to simulate action of pouring liquid. The bottle has been developed by ZHdK. The physical sound model to simulate the emerging sound, when liquid is poured out has been developed by UNIVERONA. This sound model will be optimised by the adaptive optimization technique.

**Public target** It is planned to present this methodology as a proof of concept to the scientific community to discuss and improve it, such that a successful implementation as a product would be possible.

1.4 Dynamic metaphors for control mapping

- Description: Solution to designing control mappings for interactive sonic artifacts in such a way as to suggest their proper use (introduced in D3.1)
- Exploitable products: Interactive, manually-operated sound-producing products of various description
- Timetable for commercial use: Unknown (further development required)
- Patents: Essentially unpatentable (prior art exists)
- Owner: ZHdK (Franinovic/Visell)
- Exploitation channels: Future software frameworks; Consulting

1.5 Physical lights

- Description: Manipulable lamps based on physical metaphors for their illumination control
- Exploitable products: Future lamps, toys, and similar artifacts
- Timetable for commercial use: Unknown
- IP Protection: Copyright
- Owner: ZHdK (Franinovic/Visell)
- Exploitation channels: Production (directly) or licensing

1.6 EcoTile

- Description: Floor tile with active control over perceived material properties
- Exploitable products: Architectural components; VR equipment; Other (unknown)
- Timetable for commercial use: 2010-
- IP Protection: Possible patent
- Owner: Concept, Design: ZHdK and McGill University (Franinovic/Visell)
  Sound synthesis model: UNIVERONA
- Exploitation channels: Production (directly), product licensing, contractual installation
1.7 Adaptive Sounding Artifacts

- Description: Active-learning type algorithm for preference-based design of sound in a product based on a parametric model
- Exploitable products: Interactive sound producing products (various)
- Timetable for commercial use: Unknown
- IP Protection: Further development required prior to patent
- Owner: NIPG and ZHdK (Franinovic/Visell)
- Exploitation channels: Software sound design tools (sales), or algorithm licensing; Consulting

1.8 Expected future activities not yet exploitable

- Human factors evaluation methods for ecological sonic interaction design (preference, performance): Joint work with IRCAM during CLOSED project period 2.
- Simplified control space identification methods based on psychoacoustic-parameter subspace visualization: Future work with NIPG.
2 Dissemination of knowledge

2.1 Overview table

The overview table of dissemination of knowledge is presented p. 15.

2.2 Presentations

Summer school

- 2006
  - D. Devallez presented her Ph.D. project and research in progress in relationship with CLOSED at the S2S² Summer School in Barcelona, Spain, July 24-28, 2006.
- 2007
- 2008
  - S. Papetti will present his Ph.D. project and research in progress, in relationship with CLOSED, at ICAD 08 (Think Tank session) in Paris, France, June 23, 2008.

Seminars

- 2006
- 2007
  - Y. Visell, “Presentation of the CLOSED project”. AI-Lab, University of Zurich, Brown Bag presentation, October 2007.
  - Y. Visell, “Presentation of the CLOSED project”. BIRG Lab, EPFL Lausanne, Switzerland. October 2007.
  - D. Rocchesso, “Presentation of the CLOSED project”. The lecture “Sonic interaction design and sound synthesis” held for the course “Audio Signal Processing” at the Helsinki University of Technology, Laboratory of Acoustics and Audio Signal Processing, November 7, 2007 http://www.acoustics.hut.fi/teaching/S-89.3580/
- 2008
• K. Franinovic. “Presentation of the CLOSED project”. Summit on New Media Arts Policy and Practice, The Asia-Europe Foundation (ASEF) and the International Federation of Arts Councils and Culture Agencies (IFACCA), Singapore, July 2008.

Conferences and workshops

• 2006
  - D. Rocchesso. Presentation of the CLOSED project and established contacts with other EU NEST project, namely BrainTuning and TACT. CIM (XVI Colloquio di Informatica Musicale). Genova, Italy. October 24-25, 2006.

• 2007
  - D. Rocchesso and P. Polotti jointly with IRCAM. Presentation of the CLOSED project within the workshop at the HGKZ in Zurich, Switzerland. January 9, 2007.
    http://videolectures.net/mbc07_purwins.cls/
    http://web.mac.com/davidrh/MBCworkshop07/Day_2.html

• 2008

2.3 Conference organization

• 2006
• 2007
• 2008

2.4 Workshop and Course Realization

• 2006
• 2007
  
  http://www.soundandmusiccomputing.org/summer_school/stockholm2007
  • Organization of the course "Acoustic Display and Interactive Sound" held at ZHdK Interaction Design program. Zurich, Switzerland. December 6-21, 2007. (see website section).
  
  http://web.mac.com/davidrh/MBCworkshop07/Workshop.html

• 2008
  • Organization of the workshop “Sonic Interaction Design: Sound, Information, and Experience” at the COST Action IC0601 on Sonic Interaction Design, to be held in Florence, Italy. April 6, 2008.
  
  http://www.cost-sid.org/wiki/CHIworkshop
  
  http://minet.wordpress.com/events/trainingcourse2008/
  
  http://sonicinteraction.wordpress.com/

2.5 Reports

• 2006
  • 2007

• 2008

2.6 Master Thesis and PhD Thesis

• 2006
• 2007

• 2008

2.7 Publications

Book Chapters

Conference Abstracts and Posters

• 2006
• 2007
• 2008
2006


2007


2008

- http://www.focused08.ch/

Refereed Journal Papers
• 2006
• 2007
• 2008
  • D. Devallez, F. Fontana and D. Rocchesso, “A virtual model for linear access to auditory distance”. Submitted to Acta Acustica united with Acustica.

2.8 Project web-sites
• Creation of the CLOSED website presenting the project and containing the different deliverables and SDT.
  http://closed.ircam.fr
• Creation of a trac-based software management web site with a browsable svn repository containing the software models and their supporting documentation.
  http://trac.soundobject.org
• Creation of wiki website containing proposals for CLOSED prototypes, a platform for discussion with contractors.
• Creation of wiki website documenting kitchen field research and analysis.
  http://actionanalysis.wikispaces.com/
• Creation of two CLOSED course websites at ZHdK containing lectures about CLOSED related topics and references, participatory exercises, field video materials and student projects.
  http://sonic.wikispaces.com/
  http://cumulusound.wikispaces.com/
http://web.mac.com/davidrh/MBCworkshop07/Workshop.html
http://videolectures.net/mbc07_whistler/

2.9 Film/video

- A video showing a Gamelunch performance was uploaded on the YouTube web site http://www.youtube.com/watch?v=-gbAjeLD7MY
- Event_OS short video sequences were uploaded on the YouTube web site http://youtube.com/vipsunivr

2.10 Exhibitions & demonstrations

- 2006
- 2007
  - S. Della Monache, P. Polotti and D. Rocchesso. Presentation of the Gamelunch, within the Basicdesign-Lab organized by the Department of Art and Industrial Design of the University IUAV of Venice, Italy. June 29, 2007.
- 2008
  - Presentation planned of the CLOSED project and demonstration planned of sound-enhanced prototypes. Theme: ”Demain c’est aujourd’hui”. Biennale Internationale du Design de Saint Etienne, November 2008.
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<th>Planned/actual dates</th>
<th>Type</th>
<th>Name</th>
<th>Type of audience</th>
<th>Countries addressed</th>
<th>Size of the audience</th>
<th>partner responsible / involved</th>
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<td>ACM Int. Conf. On Multimodal Interfaces 09</td>
<td>research / industry</td>
<td>International</td>
<td>300</td>
<td>ZHdK</td>
</tr>
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<td>2nd ISCA/APSAC Workshop on Perceptual Quality of Systems</td>
<td>research / industry</td>
<td>International</td>
<td>100</td>
<td>ZHdK</td>
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<td>24-/25/10</td>
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Figure 2.1: Dissemination of knowledge: Overview table
3 Publishable results

For the moment, the CLOSED project has not yet publishable results. But the exploitable knowledge presented in 1 p. 5 will lead to publishable results for the second period of the project.