

# Scientific Report from ConGAS Short Term Scientific Mission (STSM) to Reykjavik

## Details

### Applicant

Kjetil Falkenberg Hansen  
Department of Speech, Music and Hearing (TMH), KTH  
Lindstedtsvägen 24  
10044 Stockholm, Sweden

### Host institution

Tone and Video Lab, Listaháskóla Íslands

### Mission period

March 27 - April 12, 2005

## Purpose

Purpose of the STSM to Tone and Video lab (TV) in Reykjavik was to work on interaction and new musical interfaces with experts and students in an artistic setting. TV is a part of the Iceland Academy of Arts and provides an excellent environment for this.

## 1 Objectives

Some of the original objectives in the research project had to be refined and changed (see below). The emphasis was moved from looking at the control of two specific models to looking at novel models and interactive interfaces in general. Also, evaluation of the interaction and expressibility was carried out in a different way than originally planned. Still, the initial question “Finding ways to play new musical instruments” could be approached with a study on playability and possibilities for expressive interaction with the student project.

The three models that were intended to be used were “Skipproof” for scratching and “pDM” for conducting, and “Expressiball” for evaluating the expressivity. All models are developed at KTH.

### 1.1 Changes

The initial working plan and objectives had to be adjusted to better take advantage of the unexpected and welcome situation of having 16 students to collaborate with. Also their miscellaneous study backgrounds had to be taken into consideration. Some of the changes were:

- students had their own project suggestions, and did not actively work with the Skipproof or pDM,
- students worked with a greater number of sensors than anticipated,

- the students spent more time on developing software solutions for their projects than planned,
- TV did have a workshop for computer work and electronics, but most students preferred to work in other places (with e.g. more purposeful tools), hence the day-to-day following up of their work was not carried through,
- the idea of using Expressiball was not applicable to most projects and was abandoned.

These changes were all established during the first meeting with the students, and assumingly they did not negatively affect the results. The whole project became less devoted to interfaces for musical instruments and more open for interactive installations (most students came from visual arts).

## 2 Work description

### 2.1 Timeline

In order to work with students, the STSM had to be moved from its initial period in January 2006. The two weeks before Easter proved to fit well in with the schedule of a course in interactive media, and a group of 16 students could participate in the work for 13 working days.

The students had scheduled workshop and lectures each day from 9.00 to 12.00, and this schedule directly affected the timeline of the project, and allowed for more interaction with the students than planned. While the STSM ended as the Easter holidays started, the students still had two more weeks of work after the break. Thus, the results from this study reflect an intermediate stage (prototype) of the student projects.

Below are some of the plenary sessions:

- Day 1 (Monday): presentations, information, lecture on musical interfaces, sensors and expressivity in music (by Hansen)
- Day 2: presentations and general discussion on each student project
- Day 3-4: tutorials by TV teachers (Audacity, Max, jitter, etc.)
- Day 5: Summary of the week, report on current stage of each project
- Day 6: Identifying equipment requirements
- Day 10: Report on current stage of each project
- Day 12: Final preparations, planning the performances/exhibitions for the following day, individual evaluation
- Day 13: Presentations, performances and exhibition of all student projects, evaluation of each project

## 2.2 Method

It was decided at an early stage to use questionnaires as a method for looking at aspects concerning expressivity and playability of instruments. With the move from building and playing musical instruments to working with interactive projects in general, this approach was reconsidered and kept. Some of the questions were altered.

Each student answered about 10 questions about their own project on the last day before the presentation. Then, after each presentation, everyone answered similar questions for the project they just witnessed. In that way, we had both the self-assessment of the student (artist), and the corresponding valuation of the audience on the same issues.

The questions (12 for self-assessment and 11 for evaluation of others) were all statements answered by indicating a point on a continuous scale from ‘disagree’ to ‘agree’. Some example questions:

- The project has similarities with existing musical instruments.
- Practising on the interaction enhances the outcome, allowing the user to be more expressive.
- The interaction effort corresponds to the response from the system.
- (...)

## 2.3 The projects

In all, 11 different projects were presented by 13 students on the last day. 3 projects were not presented nor evaluated.

At the presentation, most projects were in a nearly finished state, and a few were in a prototype state. The audience was invited to interact with the pieces where that was appropriate. Presentations were held in three adjacent rooms and outdoors (for the project *Tank*).

The following table shows the project titles, a short description and also divides the projects in two groups. One group involved Max/MSP (or similar) processing of controller or audio data, while the other group was using only hardware.

	<b>Title</b>	<b>Description</b>
Using Max/MSP or other software	Alchemy I	Controlling video playback (source and filters) with MIDI bass guitar
	Audiopainting	Guitar strings attached to a frame, amplified and processed
	Disófónn	“Guitar interface” using a Radio Baton for playing recorded sounds
	Ecco	Sensors on a human body, triggering and changing recorded sounds
	Kakefattis	Sensors under cookies on a tray triggers recordings of speech
	Stairway	Sensors on stairway steps, controlling a synthesizer
	Tank	Using a large oil tank as amplifier for sinusoidal tone sweeps to create room acoustic effects (planned to be controlled by visitor’s gestures)
	Unndóralasision	Sensors on human bodies controlling a synthesizer
No software used	DX-1.000.000	Cheap analogue synthesizer with radically modified electronics
	Iris	Analogue video feedback with electronically modified TV set
	Sound Fort	A collection of amplified found objects and electronics (planned to be processed in Max/MSP)

### 3 Results

Preliminary results from the analysis show that for the evaluated aspects, most artists have a quite good appreciation on how their piece will be experienced by the audience. Some projects, e.g. *DX 1.000.000* and *Audiopainting*, have a clear correspondance between all aspects (expected and experienced). Others, e.g. *Tank*, *Sound Fort* and *Ecco*, where often judged differently from artist to audience. Probably this was partly because those projects were in a less finished state.

One of the initial objectives was to see if an instrument was suitable for expressive performance. Arguably, the projects that came closest to the idea of building a new interface for musical expression were *DX 1.000.000*, *Audiopainting*, *Disófónn*, *Ecco*, *Stairway* and *Unndóralasision*. Of these, *Ecco* and *Stairway* had more resemblance to installations than instruments for performing, and *Unndóralasision* was found to be very dissimilar to existing instruments. The remaining three, *DX 1.000.000*, *Audiopainting* and *Disófónn*, were all found to require practise for a making a better and more expressive performance. The expected result was indeed that the audience could recognize the potential of the instrument (i.e, it was obvious that practising would lead to enhanced musical outcome).

Another (expected) result was that the projects found to have similarities with existing instruments both had a quite low threshold for successful first

interaction, and at the same time was rated to have potential for more expressively performances with practise. However, while this relationship between easy-to-play and hard-to-master was clear to see, there was no correlation to the project's attractiveness (from the question whether the audience felt invited to interact with the project).

For the 6 instrument-like projects mentioned above, the interaction effort was considered to correspond fairly well with the response from the system. The correspondance between gestures for interaction and outcome from the system was rated even lower. This is quite interesting, especially since the performers for each of these projects were considered to being able to express themselves coherently (according to a related question).

### 3.1 Discussion

Some questions led to more divergent results than others. For instance, looking at similarities with existing instruments was ambiguous with some of the projects, and even difficult. The results for such questions can only be considered for the projects that fit in with the original idea of the scientific mission.

Another uncertainty was the students' understanding of 'interaction' and 'expressivity', especially given the diverse backgrounds of music, painting, multimedia and sculpture. This could maybe have been avoided with clearer guidelines for the students, but possibly to the expense of creative and unexpected outcome such as *Tank* and *DX 1.000.000*.

A trail that seems worth following is the low correspondance between an instrument being effective and expressive, and the weak relationship between gestural input and sounding output. This could otherwise be assumed to have importance.

## 4 End summary

### 4.1 Dissimination

Because of the change in STSM period, the original goal of presenting the mission results at NIME 2006 could not be realized. A paper presentation has been submitted to NoMuTe 2006 (Nordic Music Technology Conference). The preliminary title "Testing mapping strategies for new musical instruments" needed to be changed.

Hopefully this work will lead to a follow-up project between the parts.

### 4.2 Acknowledgements

It was a privilege to work with art students from so many disciplines in one project. I would like to thank them all for the great work they did in such a short time, and also for their willingness to help this research mission by developing their projects in new directions.

I am very grateful for the great welcome the teachers Hilmar Thordarson and Haraldur Karlsson gave me (special thanks to the outstanding guide Halli Kalli), and to Listaháskóla for being so accommodating.