

**UNIVERSITÀ DEGLI STUDI DI UDINE
(ITALY)**

I wish to mention about an EU RISE proposal that I coordinated last spring. The proposal failed mainly due to a claimed weakness of one of the industrial partners' capacities. Together with some further minor flaws (standard complaining about dissemination, outreach and the like) the proposal was scored below the threshold.

I believe that the same proposal could be revitalized with a little effort, mainly by inserting a company having more capacity. By the way, this company should operate in the field of innovative electroacoustic AND/OR vibrotactile technology---examples can be found in:

- <http://www.ultrasonic-audio.com/>
- <http://ultrahaptics.com/>
- <http://www.soundlazer.com/>

Note that I say AND since both directional speakers and vibrotactile devices are usually based on single units or arrays of small transducers containing similar technology, furthermore ultrasonic if 3D (on air) haptics or extremely high acoustic selectivity needs to be achieved; in the meantime I say OR since the consortium may include the two of them as separate companies, provided they do not compete each other inside the project.

Currently interested participants are based in Italy, Denmark, France, Switzerland, China. Hence, ideally the new companies would participate from countries others than the listed ones.

The basic project idea consists of the development of a new generation of portable digital piano instruments, staying in between the touchscreen-based toy pianos and the encumbering digital keyboard. I have led the research that came up with a state-of-the-art digital piano (www.physispiano.com): during this five-year activity we recognized the need and promising market for a portable piano, however able to convey some typical sensations of the real one. Inevitably, this activity points to more basic research issues linked to questions of physical interactions with software buttons, to which you may also be interested.

Dr. Federico Fontana

General Description

Public university founded in 1978, now counting about 17,000 students. The Department of Mathematics and Computer Science is the second oldest computer science department in Italy. The HCI Lab (<http://hclilab.uniud.it>), headed by Prof. Luca Chittaro, was founded in 1998 focusing in the design of mobile systems and services, and in applications to training and rehabilitation of 3D technologies and serious games. Auditory interface design was started in December 2009.

Key Research Facilities, Infrastructure and Equipment

Audio facilities in the HCI Lab mainly serve the purpose of sound embodiment in objects and include an upright piano, several digital keyboards, high quality audio cards, small- and medium-size loudspeaker sets, T-class amplifiers, vibrational transducers of different scales for acoustic actuation, low latency multi-channel wireless audio communication, MOCAP visual capture system, measurement microphones and accelerometers, force and physiological sensors, haptic feedback devices and head-mounted displays.

Role and Profile of key people

Dr. Federico Fontana, assistant professor in the Department of Mathematics and Computer Science since December 2009, teaches sound processing, object-oriented programming and computer networks. He currently coordinates a "Proof of Concept Network" project involving UNIUD and two national companies, aiming at prototyping a portable piano instrument interface. He participates to the AHMI - Audio Haptic modalities in Musical Interfaces (SNSF-ICST 150107; coordinator: Dr. Stefano Papetti at the ZÜRCHER HOCHSCHULE DER KÜNSTE). He coordinated the FP7 FET-Open EU project 222107 NIW (2008-2011), the national project E-PHASE (2008-2011) co-funded by VISCONT, the national project REVIVAL (2008-2009) co-funded by Arena di Verona Foundation. Local coordinator of the FP6 NEST EU Project 29085 CLOSED (2006-2009).

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