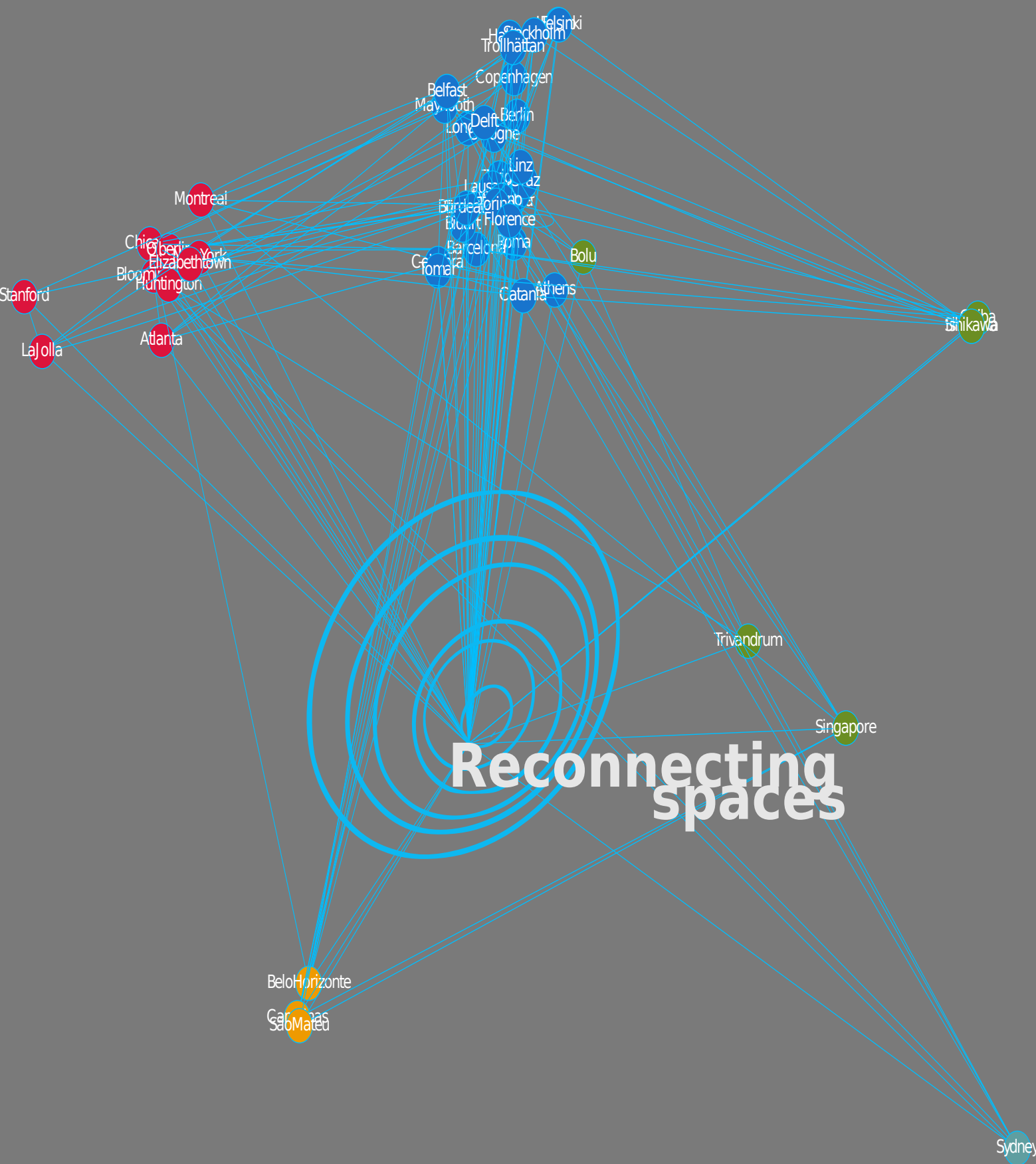


18th Sound and Music Computing Conference

June 29th - July 1st 2021

Proceedings



Reconnecting
spaces



SMC 2021

Proceedings of the 18th Sound and Music Computing Conference

June 29th – July 1st 2021

Davide Andrea Mauro, Simone Spagnol and Andrea Valle, eds.

18th Sound and Music Computing Conference
June 29th – July 1st 2021

Organization:

SMC – Sound and Music Computing Network - <http://www.smcnetwork.org>

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Proceedings of the 18th Sound and Music Computing Conference

Davide Andrea Mauro, Simone Spagnol and Andrea Valle, editors

ISBN: 978-88-945415-4-0

ISSN: 2518-3672

website: <http://www.smc2021conference.org/>

BibTeX:

```
@proceedings{18SMCCConf,  
  Editor = {Davide Andrea Mauro, Simone Spagnol and Andrea Valle},  
  Organization = {Sound and Music Computing Network},  
  Publisher = {Axea sas/SMC Network},  
  Title = {Proceedings of the 18th Sound and Music Computing Conference},  
  Year = {2021}}
```

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Music program

June 29 @ 17:30 (CEST): andamio.in – *Memorias*

June 29 @ 20:45 (CEST): Screening of the film by Jae Shim *Op. Cope: An Algorithmic Opera*

June 30 @ 15:35 (CEST): Becky Brown – *even fURTHER AWAY*

June 30 @ 18:00 (CEST): **Networked Performances**

- Julian Scordato, Paolo Zavagna, Giorgio Klauer, Nicola Privato, Nicola Raccanelli, Luca Richelli and Giovanni Sparano – *A networked laptop performance of Cornelius Cardew's Treatise by means of graphical sequencing*
- Luc Döbereiner, Gerhard Eckel and Ludvig Elblaus – *Retrograde by 0x03*
- Constantin Basica, Chris Chafe, Fernando Lopez-Lezcano, Henrik von Coler, Juan Parra Cancino and Klaus Scheuermann – *To the Core*
- Andreas Weixler, Se-Lien Chuang – *flaming tears*
- Giorgio Alloatti, Andrea Reali, Federico Briata, Francesco Casanova and Matteo Tomasetti – *Rhizomatic Mutual Jam*

July 01 @ 10:00 (CEST): Chi Wang – *Action-Reaction*

July 01 @ 15:40 (CEST): **Silent Films with Original Soundtracks**

- Lorenzo Pezzella – *Le spectre rouge*
- Michela Coppola – *Territories (Buon anno!)*
- Pietro Caramelli – *Fricot e l'estintore*
- Andrea Marazzi – *Cretinetti troppo bello*
- Dimitris Batsis – *Più forte che Sherlock Holmes*
- Francesco Brianzi – *Il cavallo del reggimento*
- Andrea Veneri – *Il duello dei paurosi*
- Alberto Mirko Zambelli – *La moda vuole l'ala larga*
- Federico Primavera – *Lea e il gomitolo*
- Nicola Cappelletti and Nicola Fumo Fratteggiani – *Le spectre rouge*

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Preface

The Sound and Music Computing Conference reaches its 18th edition!

This 18th Sound and Music Computing Conference (SMC 2021) is organized under the auspices of the Sound and Music Computing Steering Committee.

SMC 2021 is an interdisciplinary forum to share music, thoughts, needs and discoveries in this remarkable research topic that brings together art, technology, and human perception. SMC 2021 Topics of Interest include a wide selection of topics related to acoustics, psychoacoustics, technologies for audio and music, audio analysis and synthesis, spatial sound, sonic interaction design, music analysis, performance modelling, and many more.

In the original call for papers and works, SMC 2021 welcomed two types of contributions:

- Scientific contributions examining all the core topics of the Sound and Music Computing field; these contributions, which have been fully peer-reviewed, are presented as oral talks.
- Music contributions that make use of the possibilities that technology offers nowadays to create music in a broad sense.

SMC 2021 received 123 full submissions: 79 scientific contributions, and 44 musical contributions.

Out of them, SMC 2021 features 50 oral presentations and 18 musical pieces.

SMC 2021 had the help of 92 scientific reviewers that performed 342 reviews to examine all the submissions in order to compile the final Scientific Program. Based on recommendations from the Scientific Committee, the Scientific Chairs have made the final decisions and organized the presentation of the different contributions in twelve different Sessions.

In addition, since for two years in a row we missed the opportunity to visit the locations where our community is working, we later welcomed a new type of contribution: Lab Presentations. Nine institutions let us – virtually – in, allowing us to visit their spaces and learn more about their activities and research.

SMC 2021 features four keynote speakers (Chris Chafe, Scot Gresham-Lancaster, Emilia Gómez, Michele Ducceschi), all relevant members of the community in terms of scientific and artistic research. Their contributions show the diversity of the community itself.

Finally, the music program is rich. It features a special event dedicated to David Cope, and two open calls: a networked concert, and the screening of silent film sonorizations. The latter is a project in collaboration with the National Museum of Cinema that we had started last year and that we complete this year.

The conference takes place in a virtual format between June the 29th and July the 1st 2021.

We really thought we could leave COVID-19 behind us in 2020 but the persisting situation has forced us to rethink our 2021 edition. We strongly supported the decision of keeping the yearly schedule of the conference.

“Did we learn anything from COVID-19?”. This question is still very much on the table.

Surely, we have become acquainted -even obsessed- with online resources. But we have also gained awareness of the inescapable need to meet personally, physically. So, the theme of SMC 2021 is “Reconnecting spaces”. Even if forced again, hopefully for the last time, to meet online, our effort and hope is to keep our community (a worldwide one) tightly integrated, and also to expand it. Having organized the conference online since the first call, we have received contributions from researchers that probably would never have come to the physical edition.

For the second time this year, we are making a choice which is rooted in science and in politics. Is it useful to keep access to an online conference reserved to a closed group of registered participants? We do not think so. Again, this 2021 edition is open to anyone with an internet connection.

Huntington/Delft/Torino, June 2021
Davide Andrea Mauro, Simone Spagnol and Andrea Valle
SMC 2021 General Chairs

Keynotes

Keynote 1

Chris Chafe

Unlocking Musical Performances During the Lockdowns

The presentation will feature performances from the year of COVID-19 quarantines largely focused on how traditional ensembles could be reconstituted online from home. New technical work and new discoveries about the capabilities of today's network and computing infrastructure have happened with contributions from volunteer code contributors companies, a new foundation, and several computer music research centers. Above all improvements have been driven by the musicians who have taken part. The pandemic has ushered in a new phase of development driven by musicians seeking solutions, particularly ease of use and the ability to scale across worldwide cloud infrastructure. With orchestral-sized ensembles urgently in need of ways to rehearse on the network and most participants running their systems over commodity connections, this "new reality" runs counter to what's required for ultra-low-latency rhythmic synchronization. JackTrip which has generally been run as a native software application is now complemented by dedicated solutions including numerous Raspberry Pi-based systems, standalone physical web devices, and browser-based WebRTC and Pure Data versions. I conclude with some thoughts about how in our physical realms we're creatures who listen and function with inherent delays and Internet Acoustics is a new realm into which we're expanding. Pre-COVID, that was more on the level of a thought experiment and now we're accelerating towards it.

About the speaker

Chris Chafe is a composer, improviser, and cellist, developing much of his music alongside computer-based research. He is Director of Stanford University's Center for Computer Research in Music and Acoustics (CCRMA). In 2019, he was International Visiting Research Scholar at the Peter Wall Institute for Advanced Studies The University of British Columbia, Visiting Professor at the Politecnico di Torino, and Edgard-Varèse Guest Professor at the Technical University of Berlin. At IRCAM (Paris) and The Banff Centre (Alberta), he has pursued methods for digital synthesis, music performance and real-time internet collaboration. During the pandemic he's released an album, "Time Crystal" on Ravello Records, performed over 60 concerts online and been a contributor to a large volunteer effort for improvements to network music performance. At CCRMA he is involved in research into wavefield synthesis for physical models and learning from his co-workers about deep machine learning networks for music prediction and how quantum computing technologies can be introduced into music making.

<http://chrischafe.net/>

Keynote 2

Scot Gresham-Lancaster

Computer Network Music - An Examination of the Roots of a New Genre of Computer Music

A new genre of music practice where interactions of networks of personal computers generate note and sound choices is described. It is the speakers feeling that this approach grew directly out of cultural sense of a collective technological utopia. This approach was realized by the availability of personal computer technology and networking. Initially practiced by a community of electroacoustic composer/performers from the San Francisco Bay Area circa 1978, it spread to become encompassed in practices of many laptop composers in a variety of ways. There is an important distinction to between work made between heterogeneous collectives starting with the League of Automatic Music Composers and homogeneous “Laptop Orchestras”.

About the speaker

Scot Gresham-Lancaster is a composer, performer, instrument builder, and educator. He is a Research Scientist with the startup StrangeData LLC and Visiting Researcher at CNMAT UC Berkeley. The focus of his research is in the sonification of data sets in tight relationships with visualizations, (multimodal representations). As a member of the HUB, he is an early pioneer of networked computer music and has developed many “cellphone operas”. He has created a series of co-located international Internet performances and worked developing audio for several games and interactive products. He is an expert in educational technology.

<http://scot.greshamlancaster.com/>

Keynote 3

Emilia Gómez

TROMPA: Towards Richer Online Music Public-domain Archives

In this talk, I will present the main approach and outcomes of the TROMPA Horizon 2020 European project, which I have coordinated in the last years with researchers on the use of machine and human intelligence for the enrichment of classical music archives. Classical music, although a historical genre, it is continually (re)interpreted and revitalised through musical performance. TROMPA intends to enrich and democratise publicly available classical music archives through a user-centred co-creation setup. For analysing and linking music data at scale, the project employs and improves state-of-the-art technology. Music-loving citizens then cooperate with the technology, giving feedback on algorithmic results, and annotating the data according to their personal expertise. Following an open innovation philosophy, all knowledge derived is released to the community in reusable ways. This enables many uses in applications which directly benefit crowd contributors and further audiences. TROMPA demonstrates this for music scholars, orchestras, piano players, choir singers, and music enthusiasts.

About the speaker

Emilia Gómez is Lead Scientist of the HUMAINT project that studies the impact of Artificial Intelligence on human behaviour, carried out at the Joint Research Centre, European Commission. She is also a Guest Professor at the Department of Information and Communication Technologies, Universitat Pompeu Fabra in Barcelona, where she leads the MIR (Music Information Research) lab of the Music Technology Group and coordinates the TROMPA (Towards Richer Online Music Public-domain Archives) H2020 project.

Emilia Gómez's work has been involved in the Sound and Music Computing Network for many years, contributing in several roles such as author, reviewer and board member. She has also been serving the ISMIR community, being the first woman president of the International Society for Music Information Retrieval. She is particularly interested in improving gender and cultural diversity of our research field.

<http://www.emiliagomez.com/>

Keynote 4

Michele Ducceschi

Real-time, Large Scale Physical Modelling Sound Synthesis

Physical modelling sound synthesis has long roots. In fact, the first ever example of a partial differential equation dealt with the musical problem of the vibrating string, which puzzled the minds of the most renowned scientists of the mid-1800s. The ideas that came into existence during this “vibrating string controversy” established the foundation of early physical modelling synthesis techniques, from digital waveguides to modal methods. Today, mainstream numerical methods can be employed to solve complex mathematical equations using just a fraction of the available CPU. But things are not straightforward, and considerable effort is spent in the design of suitable integration algorithms. In this talk, a coarse review of the leading ideas in physical modelling sound synthesis will be given. In the second part, illustrative examples of typical objects (oscillators, strings and plates) will be shown. Finally, demos of advanced physical models (a plate reverb, and a spring-bar network called Derailer) will be played. The demos are freely available for download at www.physicalaudio.co.uk.

About the speaker

Michele Ducceschi currently serves as Principal Investigator for the European Research Council (ERC) Starting Grant NEMUS. This is a 5-year project aiming at synthesising the sound of historical musical instruments, that are currently out of playing condition. Previously, he was a Leverhulme Early Career Fellow (2017) at the Acoustics and Audio Group at the University of Edinburgh, Scotland. He was also a Royal Society Newton International Fellow (2015) and part of the NESS project. Ducceschi’s research deals primarily with the sound synthesis of acoustic instruments by physical modelling. He is particularly interested in the efficient simulation of nonlinear systems, either lumped or distributed, and he is also interested mechanical reverberation.

<http://mdphys.org>

Lab presentations

University of Iceland - Acoustic and Tactile Engineering (ACUTE) Lab

We will present a research and development project which two research groups at the University of Iceland that are working together on. The project is on developing an acousto-vibrotactile solution that with the purpose of increasing music enjoyment of cochlear implant recipients. The two research groups are Acoustic and tactile engineering (ACUTE) located in the faculty of Industrial Engineering, mechanical Engineering and Computer Science and the Vision lab located in the faculty of Psychology.

We will also present other ongoing projects which ACUTE lab is working on, e.g. Virtual acoustics and relating 3D scans of pinnae to measured HRFTs.

Acoustic related research at the University of Iceland is relatively new and for this reason we would really appreciate the opportunity to present our work to SMC2021 attendees.

Aalto University - Acoustics Lab

Tapio Lokki, Nils Meyer-Kahlen, Sebastian Schlecht, and Vesa Välimäki
Aalto University, Acoustics Lab, Department of Signal Processing and Acoustics, Espoo,
Finland

The professor's and researchers working at the Aalto Acoustics Lab have prepared video presentations and demos in the special facilities of the laboratory.

The laboratories were renovated in two years ago, so they are now in great shape. Most of the video material is recorded binaurally so that it can be enjoyed well with headphones. The spaces include the Large Anechoic Chamber named after its designer Lampio, the Variable Acoustics Room Arni (named after Paavo Arni, a Finnish pioneer of variable acoustic design), the Listening Room Ojala (named after Prof. Matti Ojala, who discovered the transient intermodulation distortion), sound-proof listening booths, and a Multichannel Anechoic Room called Wilska (named after the Finnish developer of an early dummy head in the 1930s).

The Large Anechoic Room is the most silent place in Finland, with a background noise level of -2 dB. Our anechoic demonstrations show the directivity of the human mouth, distance decay, and a balloon pop completely free of reverberation. In the Variable Acoustic Room Arni, the listeners can appreciate the dramatic changes in the room reverberation caused by opening and closing all or some of the panels in all walls of the room.

The Listening Room demo will reveal what can be achieved with a multichannel audio system containing a dozen large hi-fi loudspeakers. The Multichannel Anechoic Room Wilska has over 40 small loudspeakers installed on a spherical grid.

In the demo, the audience can hear how the same excerpt of orchestral music can be played in different concert halls, such as the Berlin Philharmonie and the Berlin Konzerthaus, using a virtual acoustic system developed at Aalto.

Furthermore, the video presentation will give information about the BSc, MSc, and doctoral education provided in the field of acoustics and audio technology at Aalto University.

All our teaching in MSc and doctoral levels is given in English.

<https://www.aalto.fi/en/aalto-acoustics-lab>

University of Milano - Laboratorio di Informatica Musicale (LIM)

LIM - standing for Laboratorio di Informatica Musicale (Music Informatics Laboratory) - is one of the main labs of the Department of Computer Science, Università degli Studi di Milano. It includes 4 rooms equipped with music, multimedia and computer devices. Established in 1985, under the direction of its founder Goffredo Haus LIM hosted composers and renowned experts such as Angelo Paccagnini, Antonio José Rodríguez Selles, Franco Donatoni and Dante Tanzi.

Research Topics:

- Sound & Music Computing
- Multilayer navigation of music contents
- Music Information Retrieval
- Sound synthesis and rendering in interactive contexts
- Technologies for music teaching and learning
- Cultural heritage preservation and exploitation

Standards for Music Representation

The LIM is actively involved in the creation of international standards for the representation of music information. In 2008 it played a key role in the standardization of the IEEE 1599 format, and currently it is leading the revision of the standard. Additionally, the LIM contributes to the revisions of the MIDI standard and to the W3C group on new formats for music notation.

Projects and Collaborations

Along more than 30 years of activities, the LIM has taken part in national and international scientific projects and has established collaboration with several institutions, including: Teatro alla Scala, Bolshoi Theater, RAI Radiotelevisione Italiana, RSI Radiotelevisione Svizzera, Microsoft, Verdi Orchestra of Milan, IEEE Computer Society, Ricordi Historical Archive, Italian Ministry of Cultural Heritage. Among the most notable projects, relevant examples include the digitization and exploitation of the Teatro alla Scala archives, the realization of the sound section of the National Science & Technology Museum in Milan, the release of multimedia products for Pearson, the project Bach Digital with the Leipzig Bach Archiv, the realization of the music collection of the European Library of Information and Culture (BEIC), the research on 3D audio for the NASA Charles Ames Research Center.

Teaching

Within the degrees offered by the Computer Science Department, the LIM is the reference research structure for education in topics related to sound and music computing. The study path is structured as follows:

- Bachelor degree in Music Informatics;
- Master degree in Computer Science, with a major in Music Informatics;

- PhD in Computer Science, with research topics in Sound and Music Computing. Within the bachelor degree, the LIM staff is in charge of courses in Acoustics, Databases, Economy of Musical Heritage, Informatics for Music, Informatics for Sound, Legal Aspects of Music Information, Methods and Technologies for Music Publishing, Models of Music Perception, Music Semiotics, Digital Technologies for Music Information Restoration. Within the master degree, the LIM staff is in charge of courses in Audio Pattern Recognition, MIDI Programming, Music Programming, Organization and Digitization of Multimedia Archives, Sound in Interaction, Timbre Programming.

Equipment

LIM assets include a research lab (approx. 100 m²), a silent booth and a large acoustically insulated room with reconfigurable internal acoustics. The lab is equipped with dedicated instrumentation, including devices for the digitization and restoration of analog audio materials, MIDI chains, and electronic musical instruments.

<https://www.lim.di.unimi.it/>

University of Trento - Creative, Intelligent and Multisensory Interactions Laboratory (CIMIL)

The Creative, Intelligent and Multisensory Interactions Laboratory (CIMIL) is one of the research teams within the Department of Information Engineering and Computer Science of University of Trento.

CIMIL is an interdisciplinary research lab committed to research on new forms of interaction and experience, based on emerging technologies. The aim is to be at the forefront of innovation on various sectors, including the industrial, artistic and cultural ones. Our vision is to design and create innovative technologies to solve real-world problems. We believe that it is of crucial importance to understand the needs of people in order to design technologies effectively capable of delivering optimal user experiences and addressing community-driven problems.

To this end, CIMIL promotes an interdisciplinary research culture that brings together diverse areas of interest and inquiry, including technology (engineering, computer science), humanities (social sciences, ethics, experimental psychology), and art (music, interactive installations).

Our work falls into four broad categories:

- *Education*: We teach students to design, develop and evaluate proof of concepts prototypes of interactive systems that have intelligent and multisensory features.
- *Basic research*: We aim to devise novel hardware and software multisensory technology and improve existing ones, as well as understand perceptions, behaviors and emotions of their users.
- *Applied research*: We aim to support and empower specific user groups (both able-bodied and disabled, such as the visually-impaired) by means of creative, intelligent, and multisensory technology.
- *Art and culture*: We aim to explore new forms of artistic expression and production (including performance, pedagogy, composition), as well as promote and preserve cultural heritage.

<https://www.cimil.disi.unitn.it/>

Aalborg University Copenhagen - Multisensory Experience Lab (ME-Lab)

The Multisensory Experience Lab (ME-Lab) is based at Aalborg University Copenhagen, Denmark. Our work is centered on the use of multisensory technologies (e.g., virtual and augmented reality) and falls into three broad categories:

- *Basic research*: We aim to improve multisensory technology and understand its users (e.g. perception, cognition, and affect).
- *Applied research*: We aim to assist and empower specific user groups by means of multisensory technology.
- *Art and culture*: We aim to explore new forms of artistic expression and preserve cultural heritage using multisensory technology.

We are particularly interested in researching topics related to sonic interaction design for multimodal environments, simulating walking experiences, sound rendering and spatialization, haptic interfaces, cinematic VR and evaluation of user experience in multimodal environments.

This video previews a selection of our previous work related to (1) novel music instruments; (2) physical and virtual recreation of historical music instruments; (3) sound and music computing applied to therapy, education, and training; and (4) simulated spaces and real exhibits.

<https://melcph.create.aau.dk>.

University of Padova - Centro di Sonologia Computazionale (CSC)

Sergio Canazza, Giovanni De Poli, Niccolò Pretto, Antonio Rodà, Alvisè Vidolin
Centro di Sonologia Computazionale, University of Padova

Research in computer music at the University of Padua, Italy, began in the early 1970s and was formalized in 1979 by establishing the Centro di Sonologia Computazionale (CSC). During the years, CSC research moved in several directions, pushed by the advancement of technology and knowledge and by researchers' curiosity. In the virtual tour the recent research topics will be shown in the area of musical cultural heritage, multimodal interaction and music research-production.

An important theme is the preservation of musical cultural heritage, in particular for art forms in which technology had played an important role, such as electronic and computer music (in which composers worked directly with magnetic tape) or interactive multimedia installations. It is motivated by the awareness of technological obsolescence and the historical importance of the music works realized at CSC. The main results on preservation and enhancement of musical cultural heritage will be presented, such as philologically informed conservation of audio documents, access tools which recreate the experience of the original analogue devices, installations to virtually play historical and modern musical instruments, preservation methodologies of interactive multimedia installations. The multimodal interaction research opened up important new societal fields of research, such as inclusive systems dedicated to learning for people with special needs, using modeling for tracking of human motion and nonverbal 3-D sounds as a preferred communication channel. In our opinion, inclusive learning for participants with disabilities is one of the most important and urgent aims in the new millennium.

Since the 2010s, CSC has been developing interactive applications based on large-scale responsive environments and user-friendly involvement with expressive behaviour (for teaching music or for tuition of the visually impaired), emphasizing the added pedagogical value of fun and competition. Regarding music research at CSC, scientists, researchers, and technicians continue to collaborate with artists using the new art-science-interaction laboratory and CSC know-how as a support for the innovation of expressive forms in music, music theater, and interactive multimedia arts. In addition, CSC aims to promote and encourage the production of works that use computer systems to control and to create music, especially projects that use technologies developed in its laboratories. It has also developed new interfaces to play instruments, necessary to control musical timbre and the virtual space, stimulating the interest of many composers who believe that the traditional keyboard is not suited to simultaneously control multiple parameters, synthesis algorithms, and sound spatialization.

CSC is striving to be a leader in the "Society 5.0" revolution, taking advantage of the fact that music is a trans-cultural language. Currently, the CSC visions are to facilitate (1) the inclusion of people with special needs (e.g., multimodal interaction for learning and well-being, acoustic analysis for safety and security in the workplace) and (2) dialogue among

different cultures and populations (production of new cultural events, computing and cultural heritage, preservation and enhancement of audio documents, and computational creativity).

<http://csc.dei.unipd.it/>

KTH Royal Institute of Technology - Sound and Music Computing (SMC) Group

Roberto Bresin, Kjetil Falkenberg, André Holzapfel, Sandra Pauletto
KTH Royal Institute of Technology, Stockholm, Sweden

The SMC Sound and Music Computing group¹ at KTH Royal Institute of Technology in Stockholm is a research group of about 20 people within the Division of Media Technology and Interaction Design, EECS School of Electrical Engineering and Computer Science. The long-term vision of the team is “to understand human communication and interaction by sound and music so as to make them a natural part of everyday technology”. We work towards our vision through engagement in both educational and research activities. We give a number of SMC-related courses at all three levels of education: Bachelor, Master and PhD.

We actively involve students in ongoing research both as part of and beyond course activities². Among these activities are pilot experiments, prototype development, public exhibitions, performing, composing, data collection, analysis tasks, and not least bachelor and master thesis projects that lead to academic publications. The major benefit for research as we see it is the increased diversity of the research outcomes.

Our research covers a diversity of areas including music expression modelling, affective computing, sensor-based movement analysis, sonification and data representation, sonic interaction design, non-verbal communication in human robot interaction, methods for media production, sound-based methods for rehabilitation/training, music information retrieval, and computational ethnomusicology.

Our research has been funded through grants from a large set of funding bodies including the European Commission, VR Swedish Research Council, Vinnova, NordForsk, MMW, WASP-HS, Formas, The Swedish Retail and Wholesale Council, Hakon Swenson Stiftelsen, PTS Swedish Post and Telecom Authority, JSPS/Kakenhi, Swedish Energy Agency. Our research group is part of the Nordic SMC Hub network³ funded by NordForsk. During the years we have been organizing international conferences (such as the SMC conference) and creating new ones, both national and international. We have a tradition of active participation to several conferences (SMC, NIME, ICAD, ISMIR, ISON, TENOR, Audio Mostly, WAC, INTED, CHI, HRI, TEI, ACII) to which not only senior researchers and PhD candidates present their works but also undergraduate students. We continuously

¹ Sound and Music Computing group at KTH: <https://www.kth.se/hct/mid/research/smc>

² Hansen, Bresin, Holzapfel, Pauletto, Gulz, Lindetorp, Misgeld & Sköld. (2019). Student involvement in sound and music computing research: Current practices at KTH and KMH. Combined Proceedings of the Nordic Sound and Music Computing Conference 2019 and the Interactive Sonification Workshop 2019, 36–42. <https://doi.org/10.5281/zenodo.3755825>

³ NordicSMC hub <https://nordicsmc.create.aau.dk/>

publish in both peer-reviewed international journals and conferences: since January 2019 we have published about 14 journal papers, 59 conference papers, and 5 book chapters.

University of Oslo - RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion

Alexander Refsum Jensenius and Stefano Fasciani
University of Oslo

We propose a virtual tour of some music technology labs at the University of Oslo, Norway, including:

- *The Portal*: This is a room set up for researching network music with several low-latency audiovisual streaming systems and exploring the integration with other technologies such as spatial audio, motion capture, and virtual reality. The lab is central to the activities of the Music, Communication and Technology master's programme.
- *The fourMs Lab*: a lab used for studies of music-related body motion. It contains several high-end motion capture and physiological sensing systems. It also has a multichannel audio setup. The lab is used by many researchers at RITMO Centre for Interdisciplinary Studies in Rhythm, Time, and Motion.
- *Musical Robotics Lab*: a lab used for developing new musical robots, including prototyping.
- Additional labs and studios include electronics labs, video and sound studios.

In the video, we will also give an overview of ongoing sound and music computing research activities. These include network music, music information retrieval, new interfaces for musical expression, musical robotics, and embodied music cognition.

<https://www.uio.no/ritmo/english/>

Universitat Pompeu Fabra - Music Technology Group (MTG)

The Music Technology Group (MTG) of the Universitat Pompeu Fabra in Barcelona, part of its Department of Information and Communication Technologies, carries out research on topics such as audio signal processing, music information retrieval, musical interfaces, and computational musicology.

The MTG wants to contribute to the improvement of the information and communication technologies related to sound and music, carrying out competitive research at the international level and at the same time transferring its results to society.

To that goal, and guided by our values, the MTG aims at finding a balance between basic and applied research while promoting interdisciplinary approaches that incorporate knowledge and methodologies from both scientific/technological and humanistic/artistic disciplines.

In our presentation we highlight the main research challenges we are currently working on and we emphasize how we promote social and industrial impact. The senior researchers and staff of the MTG present the various topics and we also show the different spaces of the university that we use.

<https://www.upf.edu/web/mtg>



Proceedings of the 18th Sound and Music Computing Conference

