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Research Studios Austria Forschungsgesellschaft

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International Workshop Conference
on Digital Intelligence and Aware Systems

INTERACTIVE MUSIC TECHNOLOGIES

Connecting Innovative Research Networks
in Interactive Music Technologies

23 January 2020

On conference and follow up please consult: musictec.researchstudio.at

Connecting Innovative Research Networks 2020–2021

CONNECTING INNOVATIVE RESEARCH NETWORKS IN INTERACTIVE MUSIC TECHNOLOGIES: AN INVITATION TO COOPERATION

The University Mozarteum Salzburg has established itself as a world-class institute of higher learning in music and the dramatic arts. In cooperation with the University Mozarteum the Research Studio Austria Forschungsgesellschaft (RSA FG) works as an applied research organisation of agile, lean and flexible research units (studios) in digital intelligence.

With the workshop conference on “Interactive Music Technologies” researchers at both institutions cooperate to connect their work with European researchers and their networks which focus on the use of advanced digital research and technology and the uses of music in its multiple forms.

We invite leading researchers and labs in informatics, computer science, multimedia, data science and music to present their current work and activities in a one-day workshop conference to interested scholars from University Mozarteum Salzburg and other RSA FG partner universities in Austria. Additionally, the workshop conference is designed to present relevant state-of-the-art research in digital intelligence and aware systems from RSA FG.

Our objective is to build up a network of research and to develop collaborations including joint research and funding applications in the EU and the cooperation schemes with institutions outside.

The process of the workshop conference will allow the exchange of current work and near future agendas in order to form research consortia in the upcoming HORIZON EUROPE, other international as well national calls and similar grant support programs including those for SMEs and start-ups.

Presentations of current R&D projects, analyses of issues and application scenarios set the table for the discussions in which we intend

- to specify/translate visionary concepts, sketches of research agendas, roadmaps
- into proposal submissions, identification of potential consortia, with
- expected impact analysis, scalability issues, etc.

The workshop conference will also invite domain relevant start-ups with the objective of including them in research activities and partnering in the technology and innovation transfer. Participants will interact with academic and industry professionals.

The workshop conference will also cover the range of innovative methods of creating music and products for entertainment, distance teaching, and commercial and non-commercial purposes.



Prof. Dr. Peter A. Bruck
CEO and Chief Researcher, RSA FG

ART AND DIGITAL TECHNOLOGY: CHALLENGES AND COOPERATION

Art and digital technologies share a universal claim: No subject matter that could not be of interest, no dimension that cannot be penetrated and developed.

Ideally, both of them focus on people, on opening up and extrapolating human reality beyond its limitations.

But they undertake this with different objectives: Art extends that which can be experienced aesthetically, which enables knowledge, empathy, transcendence. Art addresses the unique, the individual person in her or his very personal life world.

Digital technology extends that which can be done, which enables action, analysis, decoding. Digital technology addresses the (re-)production, the largest number of possible users and the platforms for their interactions.

However, already for some time art and digital technology are blending into each other. They intertwine, as it were, and bring forth a third: the field of modern innovation which bridges these widely spaced universes and which harbours in itself the potential for a shift in paradigms.

The University of Art Mozarteum Salzburg views this field a special challenge for research and for concrete application. We wish to do this in close cooperation with competent partners in the field of digital technology.



Prof. Elisabeth Gutjahr
Rector, University Mozarteum Salzburg

SALZBURG: A WELCOMING HOST FOR RESEARCH COOPERATION

Salzburg is developing remarkably in the area of science and research.

This includes, in particular, interdisciplinary cooperation, as this kick-off conference of the RSA FG and the University Mozarteum Salzburg proves.

For technology and digitization are part of and tools for art and culture on many levels.

Outstanding speakers make this conference a must for researchers and labs in this area, for example to learn about innovative methods of creatively dealing with music.



Mag.a (FH) Andrea Klambauer
Regional Minister of Salzburg for Science

CONNECTING INNOVATIVE RESEARCH NETWORKS

Research Studios Austria Forschungsgesellschaft mbH (RSA FG)

Research Studios Austria Forschungsgesellschaft offers customers and partners applied research and development in digital intelligence. RSA FG manages the transfer of knowledge and technology from universities to markets and is organized in six research studios with research locations in Salzburg, Vienna and Linz.

Since 2003, RSA FG has acted as an agile, non-university research institution, bringing applied research from universities into markets and society. RSA FG is governed by EU law and regulations regarding technology research organisations.

RSA FG aims to increase the added value of innovations through professional project management, iterative prototyping and continuous improvement of user and customer benefits. Its focus is on all areas of digital intelligence and ICT.

The competencies of its research teams include the fields of geo-informatics, pervasive computing, smart agents, semantic technologies and data science as well as artificial intelligence and social micro learning.

RSA FG is organized in research studios, which are flexible, market-oriented teams of five to twenty researchers led by renowned scientists who develop application-oriented and customer-oriented research:

The RSA FG has six locations in three Austrian cities with the following research units:

- **Research Studio iSPACE – GIScience for Smart Settlement Systems, Energy and Mobility**, Salzburg
- **Research Studio DSc – Data Science, Data Analytics, IR, ML, Data Market Tech**, Wien-Salzburg
- **Research Studio PCA – Pervasive Computing Applications, Aware Systems, Cognitive Computing**, Linz- Wien -Salzburg
- **Research Studio iSPACE – GIScience for 4D Environments, IoT, Industry 4.0 Assistive Tech**, Salzburg
- **Research Studio SAT – Smart Applications Technologies, AI, Semantic Web, Matching Tech**, Wien
- **MoKnowLab – Mobile Knowledge Lab, AI based MicroLearning**, Linz-Salzburg-Wien

The primary cooperation partners of RSA FG are the Paris Lodron University Salzburg and the University Mozarteum Salzburg.

RSA FG is continuously working to optimize its unique position in research methodology and organization of iterative, rapid prototyping and modular iterative refraining (MIR).

International companies as well as public administrations in Austria, the EU and beyond implement its technologies and solutions. More than sixty start-up companies also use them.

RSA FG has developed new paradigms in digital intelligence applications such as **MicroLearning** (2005), **Web of Needs** (2011) or **Attention Aware Systems** (2018), and has launched a series of spin-offs.

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ORGANIZING INSTITUTIONS

University Mozarteum Salzburg

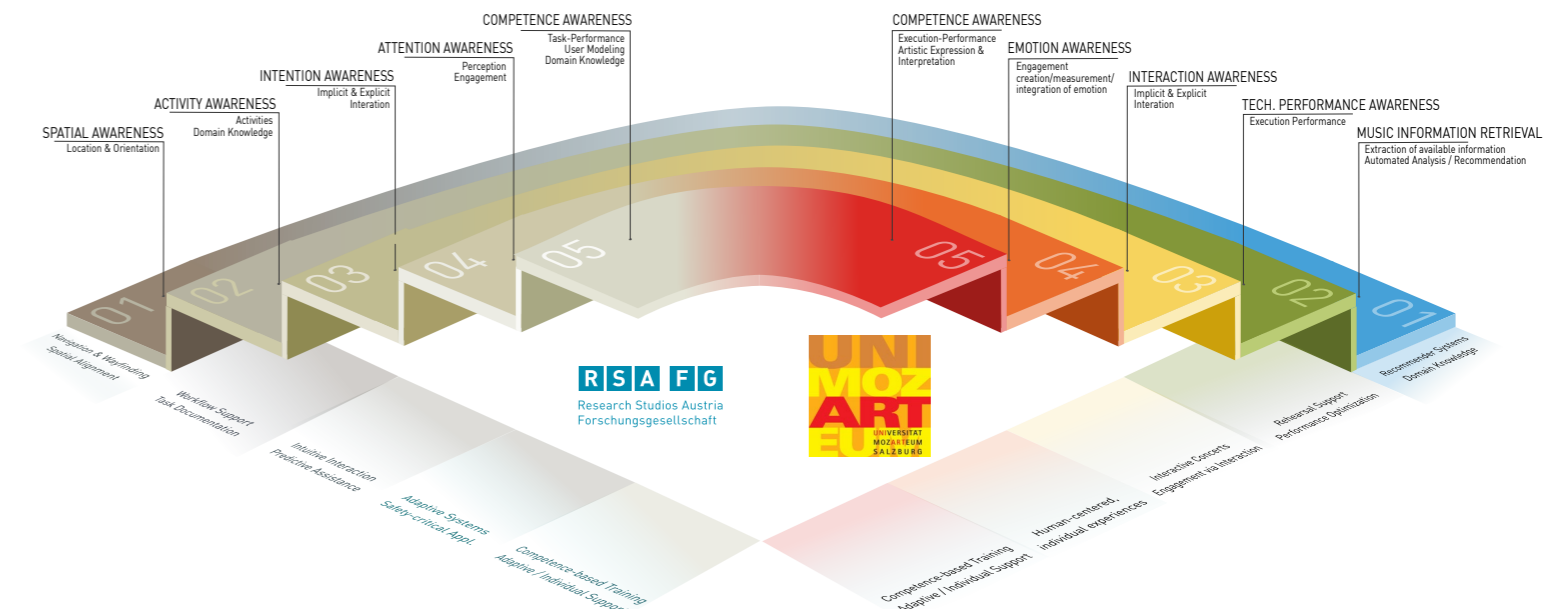
At University Mozarteum Salzburg, Mozart is our inspiration, music our tradition, art our passion. In the heart of Salzburg exceptional talents mature into artistic personalities - on the pulse of time, for the world's stages. The cultural heritage of Europe forms the foundation on which we, an international community, promote a liberal and tolerant dialogue, critically reflecting on the society we live in today.

The University Mozarteum Salzburg offers more than 40 artistic and educational disciplines in the fields of music, performing and fine arts. Around 1,700 young artists from all over the world receive comprehensive training in numerous instrumental subjects, in composition, conducting, singing, music theater, acting, directing, stage design, music and dance education, art and art education as well as in music education and musicology.

500 teachers, many of them internationally known artists and educators, pass on their knowledge and their art and fulfill the university with lively discussion.

The history of the Mozarteum dates back to 1841 and was marked by outstanding personalities such as Bernhard Paumgartner, Clemens Krauss, Paul Hindemith, Carl Orff, Nikolaus Harnoncourt and Sándor Végh. The University Mozarteum Salzburg sees it as its task to contribute significantly to the creation and interpretation, reflection and mediation of art and artistic practice. The central concern is optimal, individualized support for their students.

In addition to the traditional role as an excellent educational institution, the University Mozarteum Salzburg has positioned itself as a fully-fledged cultural enterprise and contributes to cultural life with numerous events by students and teachers. In the context of intensive studies in a music-open environment, the networks for later professional careers start here. The University Mozarteum Salzburg as an artistic, pedagogical and scientific center meets equally regional and international tasks. In the international exchange of teachers and students, scholarship programs, exchange concerts and joint projects, the Mozarteum maintains worldwide relationships with friendly music and art academies.



CONNECTING INNOVATIVE RESEARCH NETWORKS



Prof. Elisabeth Gutjahr
Rector, University Mozarteum Salzburg

Elisabeth Gutjahr is rector of the University Mozarteum in Salzburg. Gutjahr spent her childhood in Bonn and Geneva, two cosmopolitan cities that shaped her development.

After completing her studies (rhythm and music theory) in Stuttgart and Cologne, Elisabeth Gutjahr was appointed professor at the State University of Music Trossingen in Baden-Württemberg at the age of 26.

The further development of the institution was always of concern to her – in the Senate, the University Council and since 2006 also as Rector, where she was re-elected in 2012 in this function.

In addition, she was involved in the rector conferences, the State Music Council (Presidium), the Education Committee of the German Music Council (Deputy Chairwoman), the Quality Advisory Board of the University of Gutenberg in Mainz and, since 2015, the AEC Council.

Gutjahr contributes to numerous advisory boards at the Musikfreunde Donaueschingen, the Zimmertheater Rottweil 2002 e.V. or regio tv Ravensburg.

The tensions between the score and the performance in music, between the book and the stage in theatre are of particular interest to her. She is also interested in interdisciplinary processes that combine music, theater, dance, language, film and visual art. From an early stage, she focused on text design in the context of music.

Elisabeth Gutjahr has also organized competitions and festivals of contemporary music and has worked as a music dramaturge, choreographer and stage director.

Selected publications:

Elisabeth Gutjahr has written several artistic and music-educational articles such as *Der Mythos Kreativität* (Verlag Wissenschaft und Bildung, Berlin, 1996) as well as essays on music and concert educational theory, music education, improvisation and creative processes. She has written several radio plays and also the cycle of poems *Tractatus logico-poeticus*, to which the award-winning audio book *Wittgenstein* with Klaus Löwitsch refers (commission and cooperation).

Elisabeth Gutjahr is the mastermind behind the lighthouse project of the University Mozarteum and works currently on a series of up to thirty innovative music films entitled "SPOT ON MOZ ART®". This multi-year project invites creatives from all around the world to produce with digital media tools in an original and creative manner music videos, short films, media art, games and much more focussing on the piano sonatas of Wolfgang Amadeus Mozart.

In case of interest please contact: spotonmozart@moz.ac.at



Prof. Dr. Alois Ferscha
Director, Research Studio Pervasive Computer Applications;
Head, Institute for Pervasive Computing, Johannes Kepler University
Linz, CEO & Scientific Director, Pro2Future GmbH, Austria

Alois Ferscha focuses his research on pervasive and ubiquitous computing, embedded AI, cognitive systems and high performance simulation. He has (co-)authored more than 300 technical papers on topics related to pervasive, ubiquitous, mobile, wearable and distributed computing. Alois Ferscha is an active consultant to the FET group within the European Commission (Directorate-General for Communications Networks, Content and Technology), and to the Austrian Ministries of Science and Research as well as Innovation and Technology. He is Austria's representative in IFIP TC-10 (International Federation for Information Processing, TC10 – Computer Systems Technology). As an invited researcher or guest professor he was visiting the Dipartimento di Informatica, Università di Torino, Italy, at the Dipartimento di Informatica, Università di Genova, Italy, the Computer Science Department, University of Maryland at College Park, Maryland, USA, and at the Department of Computer and Information Sciences, University of Oregon, Oregon, USA.

Alois Ferscha is member of the OCG, GI, ACM, IEEE and holds the Heinz-Zemanek Award for distinguished contributions in Computer Science, the Cross Border Award 2009, the Innovationspreis 2009, the "Innovationspreis" of the "Multimedia Staatspreis 2011", and the "Ö-WGP Zukunftspreis 2018". Ferscha is the master mind and research leader of the Austrian national competency centre, Pro2Future GmbH, which does research and development in the area of industrial information and communication technologies, particularly in the fields of cognitive products, cognitive production systems, Industry 4.0, smart production and related fields as well as services associated with the R&D activities

Selected publications:

- G. Weichhart, A. Ferscha et al.
Human/machine/roboter: technologies for cognitive processes. e & i Elektrotechnik und Informationstechnik, Springer Vienna, 5 pages, October 2019
- M. Haslgrübler, B. Gollan, A. Ferscha
Towards Industrial Assistance Systems: Experiences of Applying Multi-sensor Fusion in Harsh Environments
Physiological Computing Systems, 11 pages, ISBN: 978-3-030-27950-9, August 2019.
- K. Zia, A. Ferscha, D. Trendafilov
Conceptualization of Cultural Diversity for Efficient and Flexible Manufacturing Systems of the Future
COGSCI '19 Proceedings, pp. 1290-1296, July 2019.
- K. Zia, D. Saini, U. Farooq, A. Ferscha
Web of Social Things: Socially-Influenced Interaction Modeling. Proceedings of the 15th Intn. Conference on Advances in Mobile Computing & Multimedia, ACM DL, New York, pp. 123-130, Dec. 2017.
- A. Ferscha
A Research Agenda for Human Computer Confluence
Human Computer Confluence Transforming Human Experience Through Symbiotic Technologies, Editors: Gaggioli Andrea, Ferscha Alois, Riva Giuseppe, Dunne Stephen, Viaud-Delmon Isabelle, DE GRUYTER OPEN, pp. 7-17, ISBN: 978-3-11-047113-7, June 2016.
- A. Ferscha
Implicit Interaction. This Pervasive Day: The Potential and Perils of Pervasive Computing, Editors: Jeremy Pitt, Imperial College Press, pp. 17-36, ISBN: 978-1848167483, April 2012.

KICK-OFF FOR RESEARCH COOPERATION: INTERNATIONAL WORKSHOP CONFERENCE ON INTERACTIVE MUSIC TECHNOLOGIES

23 JANUARY 2020
HOTEL BILLROTH
ST. GILGEN AM WOLFGANGSEE
AUSTRIA

10:30 – 11:00	WARM-UP AND WELCOME
11:00 – 11:20	Interactive Music Technologies and Digital Intelligence Prof. Dr. Peter A. Bruck, CEO and Chief Researcher, RSA FG Music & Art & Innovation Rector Prof. Elisabeth Gutjahr, University Mozarteum Salzburg
11:20 – 12:00	Aware Systems: Linking Computer Attention and Human Performance Prof. Dr. Alois Ferscha, Studio Director, Pervasive Computer Applications Head, Institute for Pervasive Computing, Johannes Kepler University Linz, Austria
12:00 – 12:45	Show and Tell by IMT Labs Part I – Discussion moderated by Dr. Benedikt Gollan Electronic Music Performance and Real-Time Interaction with Intelligent Music Systems Prof. Dr. Sergi Jordà, Head, Music & Advanced Interaction (MAIn) team and Music Technology Group, Universitat Pompeu Fabra, Barcelona, Spain
12:45 – 13:00 SPOT	Music Performance: Technology Undressed of its Everyday Understanding Prof. emerita Helmi Vent, Director of Lab Inter Arts – LIA, University Mozarteum Salzburg, Austria
13:00 – 14:00	NETWORKING LUNCH
14:00 – 14:30	Show and Tell by IMT Labs Part II – Discussion moderated by Dr. Christian Thomay Videos from Music and Movement Interaction Dr. Frederic Bevilacqua, Head Researcher – Sound Music Movement Interaction team; IRCAM, Paris, France Musical Practice: Movement Science and Kinesiology Prof. Dr. Stefania Serafin, Multisensory Experience Laboratory, Department of Architecture, Design and Media Technology; Aalborg University, Denmark Category Theory and Compositional Music Interaction Dr. Maria Mannoni, Theoretical physics, PhD in Composition, Dept. of Mathematics and Informatics; Università di Palermo, Italy
14:30 – 14:45	Information Retrieval and Music: An Introduction Dr. Petr Knöth, Senior Research Fellow, Head of the Big Scientific Data Analytics Group; Open Univer- sity; Milton Keynes; Studio Director, Research Studio Data Science, RSA FG
14:45 – 15:20	Show and Tell by IMT Labs Part III – Discussion Music Information Retrieval for Intelligent Music Creation Tools Prof. Dr. Peter Knees, Information and Software Engineering Group Technical University of Vienna, Austria

15:20 – 16:00	Show and Tell by IMT Labs Part IV – Discussion Music Data Science: Semantic Web Representations for Music and Machine Learning Dr. Tillman Weyde, Senior Lecturer, Department of Computing, City University of London; UK
16:00 – 16:20	COFFEE BREAK
16:20 – 17:00	Show and Tell by IMT Labs Part V – Discussion Concert Formats as Scientific Experiments: Applying Fundamental Research in Music Practice to Audience Emotion Prof. Dr. Hauke Egermann, Professor in Music Psychology, Director of York Music Psychology Group, Department of Music, University of York; UK
17:00 – 17:20	Digital Intelligence in Music Research: Awareness as the Basis for Music Technologies of the Future? DI Dr. Benedikt Gollan, Operational Director, Research Studio Pervasive Computing, RSA FG
17:20 – 18:15	Digital Intelligence in Music Research: Outlook and the Way Ahead Fish Bowl discussion with all presenters and participants
18:15 – 18:45	Towards Data Driven Research: Using Blockchain Technology for Innovative Services for Academia and Music Research: The Bloxberg Project as Trusted Research Infrastructure Dr. Sandra Vengadasalam, Division Manager Max Planck Digital Labs, Max-Planck-Gesellschaft zur Förderung der Wissenschaften, München, Germany
18:45 – 19:00	Connecting Innovative Research Networks in Interactive Music Technologies: The Road Ahead Prof. Dr. Peter A. Bruck, CEO and Chief Researcher, RSA FG
19:00	END OF CONFERENCE

Web Videos via YouTube: <https://bit.ly/2FKy8vd>



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 Land Salzburg – Kultur und Wissenschaft



CONNECTING INNOVATIVE RESEARCH NETWORKS



Prof. Dr. Sergi Jordà
Head, Music & Advanced Interaction (MAIN) team and Music
Technology Group, Universitat Pompeu Fabra, Barcelona, Spain

Dr. Sergi Jordà holds a B.S. in Fundamental Physics (1986) and a PhD in Computer Science and Digital Communication (2005). He is a senior researcher at the Music Technology Group of Universitat Pompeu Fabra in Barcelona, where he directs the Music & Advanced Interaction (MAIn) team, and an Associate Professor in the same university, where he obtained his tenure-track position in 2011, and where he teaches courses in Computer Music, Audio Signal Processing, Human Computer Interaction (HCI), and Interactive Media.

During his undergraduate years in the 1980s, he discovered computer programming and decided to fully devote himself to live computer music. Throughout the 1990s he conceived and developed award winning interactive installations and multimedia performances, in collaboration with internationally renowned Catalan artists such as Marcel·lí Antúnez or La Fura dels Baus.

Back in the academia since the late 1990s, his current main research interests are in the confluence of HCI and tangible and musical interaction, in the application of novel interactive techniques in education, and in the possibilities of augmented communication using tabletops and brain computer interfaces. He has authored more than 20 articles in journals and book chapters, more than 50 peer-reviewed conference papers, as well as given more than 20 invited presentations and keynote talks.

Sergi Jorda is the founder and head of the "Music and Multimodal Interaction" (MMI) lab within the Music Technology Group (MTG) at Universitat Pompeu Fabra (UPF) in Barcelona. His current interests combine research from the fields of Human Computer Interaction, Music Information Research, Machine Learning and Physiological Computing, aiming at the development of the next generation of multimodal interactive expressive interfaces, also addressing the needs of the new creative industries. He currently continues to explore the applications of artificial intelligence into computational creativity (with a focus on Deep Learning techniques and music applications), covering also other application domains such as Virtual Reality, music education and well-aging.

Jorda has received several international awards, including the Ciutat de Barcelona (1999 and 2007) and the prestigious Prix Ars Electronica Golden Nica (2008). He is best known as one of the inventors of the Reactable, a tabletop musical instrument that accomplished mass popularity after being integrated in Icelandic artist Bjork's 2007-08 world tour Volta, and since 2009 he is one of the founding partners of the spin-off company Reactable Systems.

Selected publications:

- Haki, B., and Jordà, S. (2019). A Bassline Generation System Based on Sequence-to-Sequence Learning. Proceedings of the International Conference on New Interfaces for Musical Expression.
- Gómez-Marín, D., Jordà, S. and Herrera P. (2018) Drum Rhythm Spaces: From Global Models to Style-Specific Maps. In: Aramaki M., Davies M., Kronland-Martinet R., Ystad S. (eds) Music Technology with Swing. CMMR 2017. Lecture Notes in Computer Science, vol 11265. Springer, Cham.
- Ó Nuanáin, C., Herrera, and Jordà, S. (2017). Rhythmic Concatenative Synthesis for Electronic Music: Techniques, Implementation, and Evaluation. Computer Music Journal 2017 41:2, 21-37.
- Faraldo, A., Jordà, S., & Herrera, P. (2017). A multi-profile method for key estimation in EDM. In Audio Engineering Society Conference: 2017 AES International Conference on Semantic Audio. Audio Engineering Society.
- Jordà, S., Geiger, G., Alonso, M., and Kaltenbrunner, M. (2007). The reactTable: exploring the synergy between live music performance and tabletop tangible interfaces. In Proceedings of the 1st international conference on Tangible and embedded interaction (pp. 139-146). ACM.



Prof. em. Helmi Vent
Mozarteum University Salzburg, Austria
Director of Lab Inter Arts – LIA

Helmi Vent, born in Hamburg, Germany, studied art education and chamber music as well as sports education. She has careers in international competitions in rhythmic sports gymnastics (German Champion) and as a concert performing violinist. She founded and directed the "Forum für experimentellen Tanz – Duisburg". In 1983 she was appointed as university professor for Experimental Space-Sound-Body-Theatre at the Mozarteum University Salzburg from where she retired in 2013.

In 1983 she founded LIA – Lab Inter Arts, initially at the Mozarteum University, since 2013 as an independent international platform for crossover-projects in various artistic and cultural fields. LIA is open to interested people from all cultural and artistic fields. In the performance-oriented laboratory workshops, projects on various themes are developed together with the participants through improvisation processes. The participants are given incentives to bring in their artistic potential both in the current specific project and in an interdisciplinary cultural context. The basis of the project development work is the body as a sounding board – seen as an integrative interface between all kinds of reciprocal communication. LIA links its artistic practice with accompanying seminars, in which transcultural philosophy, performance studies and cultural studies are examined and discussed.

LIA ensures the sustainability on the basis of systematic video-documentation. Selected phases of the process, from the initial explorations to the final performance, are edited and published. In the center of the research is the development of an aesthetic profile of LIA's SpaceSoundBody-Theater. Furthermore there are those working methods on the research agenda which initiate and promote evolutionary and communicative processes, particularly in cross cultural projects. With the Lab Inter Arts-Projects Helmi Vent connects Film Documentary Production, Arts Based Research, and Applied Humanities.

Vent conceptualised and built up the audio-video media section at the University Mozarteum and created over more than 30 years a Video & Film Archive based on the LIA research. 2013 Helmi Vent received the "Ars docendi-Staatspreis" (state award) for excellent teaching in the category "Innovative Teaching Concepts" at the public Austrian universities.

Selected publications:

- „Statement: Performanceorientierte Projektarbeit“ In: Pasuchin, Iwan (Hg.): Intermediale künstlerische Bildung. Kunst-, Musik- und Medienpädagogik im Dialog. Kopaed, München 2007, S. 63-69.
- „Performanceorientierte Projektarbeit im Kontext intermedialer künstlerischer Bildung am Beispiel der TanzMusikTheaterWerkstatt der Universität Mozarteum Salzburg“ In: Pasuchin, Iwan (Hg.): Intermediale künstlerische Bildung. Kunst-, Musik- und Medienpädagogik im Dialog. Kopaed, München 2007, S. 105-111.
- „Spiel-Arten und Ereignisparameter im experimentellen Musiktheater am Beispiel einer TanzMusikTheaterWerkstatt“ In: Klein, Gabriele/Sting, Wolfgang (Hg.): Performance. Positionen zur zeitgenössischen szenischen Kunst. Transcript, Bielefeld 2005, S. 147-163
- „Performance – Facetten von Lebensentwürfen“ In: Bastian, Hans Günther/Kreutz, Gunter: Musik und Humanität. Schott, Mainz 2003, S. 89-106..

Selected filmography:

- Hätte Hätte Fahrradkette. Ein Performance-Labor (2016)
- 30 Jahre – Wo kämen wir hin? (2013)
- Kellertheater (2010-12)
- Lisa Sokolov, New York: Embodied VoiceWork (2010)
- City Walks Mumbai (2010)
- Wort-Klang-Körper-Essays (2002)
- Willst zu meinen Liedern Deine Leier drehn? (1995)

CONNECTING INNOVATIVE RESEARCH NETWORKS



Dr. Maria Mannone
Theoretical physics, PhD in Composition, Department of Mathematics and Informatics; Università di Palermo, Italy

Maria Mannone is a theoretical physicist and a composer. She graduated in Italy, France (IRCAM-Paris VI Sorbonne), and in the US (University of Minnesota). Her research involves mathematics, music, and images. Author of books, she gave talks and invited lectures in America, Europe, and Asia, where she is collaborating with the Tohoku University for the development of a new musical instrument, the CubeHarmonic. Currently, she is a subject expert (“cultore della materia”) at the Department of Mathematics and Informatics in Palermo.

Selected publications:

- M. Mannone, E. Kitamura, J. Huang, R. Sugawara, P. Chiu, and Y. Kitamura, CubeHarmonic: A New Musical Instrument Based on Rubik's Cube with Embedded Motion Sensor, ACM SIGGRAPH '19, Los Angeles, California, USA, pages 53:1-53:2, 2019.
- M. Mannone and F. Favali, Categories, Musical Instruments, and Drawings: A Unification Dream, Proceedings of the Conference of Mathematics and Computation in Music, Madrid. M. Montiel, F. Gómez and O. Agustín-Aquino (editors), Springer, pages 59-72, 2019.
- M. Mannone and L. Turchet, Shall We (Math and) Dance?, Proceedings of the Conference of Mathematics and Computation in Music, Madrid. M. Montiel, F. Gómez and O. Agustín-Aquino (editors), Springer, pages 84-97, 2019.
- M. Mannone, Have Fun with Math and Music. invited, Mathematics and Computation in Music Conf., Madrid. M. Montiel, F. Gómez and O. Agustín-Aquino (editors), Springer, pages 379-382, 2019.
- M. Mannone, Introduction to Gestural Similarity in Music. An Application of Category Theory to the Orchestra. Journal of Mathematics and Music, 12 (2), 63-87, 2018.



Dr. Frederic Bevilacqua
Head Researcher – Sound Music Movement Interaction team
IRCAM, Paris, France

Frédéric Bevilacqua is the head of the Sound Music Movement Interaction team at IRCAM in Paris (part of the joint research lab Science & Technology for Music and Sound – IRCAM – CNRS – Université Pierre et Marie Curie). His research concerns the modeling and the design of interaction between movement and sound, and the development of gesture-based interactive systems. He holds a master degree in physics and a Ph.D. in Biomedical Optics from EPFL in Lausanne.

Selected publications:

- Serge Lemouton, Riccardo Borghesi, Sampo Haapamäki, Frédéric Bevilacqua, Emmanuel Fléty. Following Orchestra Conductors: the IDEA Open Movement Dataset. Proceedings of the 6th International Conference on Movement and Computing, 2019.
- Judith Ley-Flores, Frédéric Bevilacqua, Nadia Bianchi-Berthouze, Ana Taiadura-Jiménez. Altering body perception and emotion in physically inactive people through movement sonification. 2019 8th International Conference on Affective Computing and Intelligent Interaction (ACII), 2019.
- Hugo Scurto, Bavo Van Kerrebroeck, Baptiste Caramiaux, Frédéric Bevilacqua. Designing Deep Reinforcement Learning for Human Parameter Exploration, 2019.
- Marion Voillot, Joël Chevrier, Frédéric Bevilacqua, Claire Eliot. Exploring Embodied Learning for Early Childhood Education. Proceedings of the 18th ACM International Conference on Interaction Design and Children, 747-750, 2019.
- Benjamin Matuszewski, Norbert Schnell, Frédéric Bevilacqua. Interaction Topologies in Mobile-Based Situated Networked Music Systems. Wireless Communications and Mobile Computing, 2019.

CONTRIBUTOR PROFILE



Prof. Dr. Stefania Serafin
Multisensory Experience Laboratory, Department of Architecture, Design and Media Technology; Aalborg University, Denmark

Stefania Serafin is Professor at the Department of Architecture, Design and Media Technology at the Aalborg Universitet, Copenhagen. Her teaching and research is on sound models and sound design for interactive media and multimodal interfaces. Before moving to Denmark, she got her PhD at CCRMA, Stanford University.

Selected publications:

- Böttcher, N. & Serafin, S., Design And Evaluation Of Physically Inspired Models Of Sound Effects In Computer Games. Aes, 35th International Conference, London, UK, 2009 February 11–13. Audio Engineering Society, p. 1-6 p, 2009.
- Nordahl, R. & Serafin, S., The Medialogy education – AAU Copenhagen: Where art and creativity meet technology. Special focus on interactive systems design, programming and evaluation in problem based learning. Venice, Italy, 2007.
- Serafin, S. & Särde, J., Treatment of resting muscle tension through transdermal sound waves of specific wavelengths, 2018.
- Gelineck, S. & Serafin, S., Physical Modeling Modular Boxes: PHOXES, The fifth International Workshop on Haptic and Audio Interaction Design (HAID). Aalborg Universitetsforlag, 3 p. 2010.
- Serafin, S., Gelineck, S., Böttcher, N. & Martinussen, L., Virtual reality instruments capable of changing physical dimensions in real-time, Enactive 2005. 8 p. 2005.



Dr. Petr Knoth
Senior Research Fellow, Text and Data Mining and Head of the Big Scientific Data Analytics Group; Open University; UK; Director, Research Studio Data Science, RSA FG

Petr Knoth is Studio Director of the Research Studio Data Science of RSA FG. He is also Senior Research Fellow in Text and Data Mining at the Knowledge Media Institute of the Open University, UK. He is an experienced researcher in the area of text and data analytics. In 2011, he founded and since then has been the Head of CORE (core.ac.uk), the world's largest full text aggregation of open access papers, which also acts as the UK National Aggregator of research papers, hosting over 14 million full text papers, having over 10 million monthly active users and being among the top 5k websites globally by user engagement measured by the Alexa Global Rank.

Selected publications:

- Herrmannova, Drahomira; Pontika, Nancy and Knoth, Petr (2019). Do Authors Deposit on Time? Tracking Open Access Policy Compliance. In: 2019 ACM/IEEE Joint Conference on Digital Libraries, 2-6 Jun 2019
- Beel, Joeran; Collins, Andrew; Kopp, Oliver; Dietz, Linus W. and Knoth, Petr (2019). Online Evaluations for Everyone: Mr. DLib's Living Lab for Scholarly Recommendations. In: Advances in Information Retrieval (Part 2), Lecture Notes in Computer Science, Springer, Cham, pp. 213–219.
- Pride, David; Harag, Jozef and Knoth, Petr (2019). ACT: An Annotation Platform for Citation Typing at Scale. In: JCDL 2019 - ACM/IEEE Joint Conference on Digital Libraries, 2-6 Jun 2019, Urbana-Champaign, Illinois.

CONNECTING INNOVATIVE RESEARCH NETWORKS



Prof. Dr. Peter Knees
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Peter Knees is an Assistant Professor of the Faculty of Informatics, TU Wien, Austria. He holds a Master's degree in Computer Science from TU Wien and a PhD from Johannes Kepler University Linz, Austria. For over 15 years, he has been an active member of the Music Information Retrieval research community, reaching out to the related fields of multimedia and text information retrieval, recommender systems, and the digital arts. His research activities center on music search engines and interfaces as well as music recommender systems, and more recently, on smart(er) tools for music creation.

Selected publications:

- Thomas Krismayer, Markus Schedl, Peter Knees, and Rick Rabiser. Predicting user demographics from music listening information. *Multimedia Tools and Applications*, vol. 78, pp. 2897-2920, Feb. 2019.
- Peter Knees, Markus Schedl, and Masataka Goto. Intelligent User Interfaces for Music Discovery: The Past 20 Years and What's to Come. *Proceedings of the 20th International Society for Music Information Retrieval Conference (ISMIR 2019)*. Delft, The Netherlands, November 4-8, 2019.
- Peter Knees. A Proposal for a Neutral Music Recommender System. *Proceedings of the 1st Workshop on Designing Human-Centric MIR Systems (HCMIR 2019)*Delft, The Netherlands, November 2, 2019.



Dr. Tillman Weyde
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Tillman Weyde is a Senior Lecturer at the Department of Computing. Before that he was a researcher and coordinator of the MUSITECH project at the Research Department of Music and Media Technology at the University of Osnabrück. He holds degrees in Computer Science, Music, and Mathematics and obtained his PhD in Systematic Musicology on the topic of automatic analysis of rhythms based on knowledge and machine learning. He is an associated member of the Institute of Cognitive Science and the Research Department of Music and Media Technology of the University of Osnabrück. He is co-author of the educational software "Computer Courses in Music Ear Training" published by Schott Music, which received the Comenius Medal for Exemplary Educational Media in 2000 and co-editor of the Osnabrück Series on Music and Computation. Tillman Weyde consulted with the NEUMES project at Harvard University and he is a member of the MPEG Ad-Hoc-Group on Symbolic Music Representation (SMR), working on the integration of SMR into MPEG-4. He was the principal investigator at City University in the EU music e-learning project i-Maestro. He currently works on Semantic Web representations for music, methods for automatic music analysis, audio-based similarity and recommendation and general applications of audio processing and machine learning in industry and science.

Selected publications:

- Jansson, A., Bittner, R., Ewert, S., Weyde, T. (2019): Joint Singing Voice Separation and F0 Estimation with Deep U-Net Architectures. *EUSIPCO*, A Coruña, Spain.
- Velarde, G., Chacón, C., Meredith, D., Weyde, T., Grachten, M. (2018): Convolution-based classification of audio and symbolic representations of music. *Journal of New Music Research* 47(3), pp 191-205.

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Hauke Egermann graduated in Systematic Musicology, Media Studies, and Communication Research (MA 2006, Hanover University for Music and Drama, Germany). Subsequently, he studied Neuroscience (PhD in Music Psychology/Neuroscience 2009, Center for Systems Neurosciences Hanover). He was Postdoctoral Research Fellow at the Centre for Interdisciplinary Research in Music Media and Technology (2009-2011, McGill University, Montreal, Canada). From 2011 to 2015 he lectured and researched at the Audio Communication Group (Technische Universität Berlin, Germany). In 2015 he was a Visiting Research Fellow at the Center for Digital Music, Queen Mary, University of London. In 2016 he was awarded his Habilitation in Musicology at the TU Berlin. Since 2016, he is member of the faculty at the Department of Music, University of York. Here he directs the York Music Psychology Group which is part of the Music Science and Technology Research Cluster.

Selected publications:

- Emerson, G., & Egermann, H. Gesture-sound causality from the audience's perspective: Investigating the influence of mapping perceptibility on the aesthetic perception of new digital musical instruments. *Psychology of Aesthetics, Creativity, and the Arts*, 2017.
- Irrgang, M. & Egermann, H. From Motion to Emotion: Accelerometer Data Predict Subjective Experience of Music. *PLoS ONE*, 11(7), 2016.
- Förstel, A. & Egermann, H. Die DJ-Performance im Club-Kontext – eine Beobachtungsstudie. *Jahrbuch Musikpsychologie*, 25, 142-158, 2015.
- Lepa, S., Hoklas, A.-K., Egermann, H., Weinzierl, S. Sound, Materiality and Embodiment: Challenges for the Concept of 'Musical Expertise' in the Age of Digital Mediatization. *Convergence – The International Journal of Research into New Media Technologies*, first published online on April 24, 2015.
- Egermann, H., Fernando, et al. Music Induces Universal Emotion-Related Psychophysiological Responses: Comparing Canadian Listeners To Congolese Pygmies. *Frontiers in Psychology: Emotion Science*, 5, 1341, 2015.



DI Dr. Benedikt Gollan
Operational Studio Director,
Research Studio Pervasive Computing
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Benedikt Gollan studied electrical engineering and information technology at the Technical University of Munich (TUM). He completed his dissertation "Sensor-based Online Assessment of Human Attention" in 2018 at the JKU Linz. In his research he focuses on automatic feature recognition in various areas (audio / video, various forms of explicit and implicit interaction). In particular, he deals with the technical recording of cognitive states (human attention) and their role in the interaction with technical information systems (attention-aware ICT).

Selected publications:

- C. Thomay, B. Gollan, M. Haslgrübler, A. Ferscha, J. Heftberger. A multi-sensor algorithm for activity and workflow recognition in an industrial setting. *PETRA '19 Proceedings, 12th ACM International Conference on Pervasive Technologies Related to Assistive Environments*, June 2019.
- B. Gollan, M. Haslgrübler, A. Ferscha, J. Heftberger. Making Sense: Experiences with Multi-Sensor Fusion in Industrial Assistance Systems. *Proceedings of the 5th International Conference on Physiological Computing Systems - Volume 1*: pp. 64-74, September 2018.
- B. Gollan, M. Haslgrübler*, A. Ferscha. Demonstrator for Extracting Cognitive Load from Pupil Dilation for Attention Management Services. *Workshop on UbIAttention: Smart & Ambient Notification and Attention Management*, Stuttgart, September 2016.