Contents

Technical program committee ix Reviewers x Preface xii

Keynotes 1

Exploiting domain knowledge in music information research 3 *Xavier Serra*

Music as the goal of training and means of rehabilitation: Evidence from brain science 7 *Mari Tervaniemi*

Perception 11

Measuring the interaction between bassoon and horn players in achieving timbre blend 13 *Sven-Amin Lembke, Scott Levine, Martha de Francisco and Stephen McAdams*

A social network integrated game experiment to relate tapping to speed perception and explore rhythm reproduction 19

Guillaume Bellec, Anders Friberg, Daniel Wolff, Anders Elowsson and Tillman Weyde

Methods for real time harmonic excitation of acoustic signals 27

Sean Enderby, Zlatko Baracskai and Cham Athwal

Sensitivity to loudspeaker permutations during an eight-channel array reproduction of piano notes 34 *Federico Fontana, Yuri De Pra and Alberto Amendola*

Reinforcement learning models for acquiring emotional musical modes 40

Tsubasa Tanaka, Hidefumi Ohmura and Kiyoshi Furukawa

About the impact of audio quality on overall listening experience 48 *Michael Schoeffler and Jürgen Herre*

Effect of timbre on melody recognition in three-voice counterpoint music 54

Song Hui Chon, Kevin Schwartzbach, Bennett Smith and Stephen McAdams

The importance of amplitude envelope: Surveying the temporal structure of sounds in perceptual research 62 *Jessica Gillard and Michael Schutz*

Modeling of melodic rhythm based on entropy toward creating expectation and emotion 69

Hidefumi Ohmura, Takuro Shibayama, Satoshi Shibuya, Tatsuji Takahashi, Kazuo Okanoya and Kiyoshi Furukawa

Design of an interactive earphone simulator and results from a perceptual experiment 74

PerMagnus Lindborg and Miracle Jia Yi Lim

How predictable do we like our music? Eliciting aesthetic preferences with the melody triangle mobile app 80 *Henrik Ekeus*, *Samer Abdallah*, *Peter W. Mcowan and Mark Plumbley*

A multipitch estimation algorithm based on fundamental frequencies and prime harmonics 86 *Arturo Camacho and Iosef Kaver-Oreamuno*

Human-machine interaction 93

Child/machine interaction in reflexive environment. The MIROR platform 95 *Anna Rita Addessi* (invited)

3D gestural interaction with harmonic pitch space 103

Thomas Hedges and Andrew McPherson

Audio-tactile feedback in musical gesture primitives: Finger pressing 109

Hanna Järveläinen, Stefano Papetti, Sébastien Schiesser and Tobias Grosshauser

VocaRefiner: An interactive singing recording system with integration of multiple singing recordings 115 Tomoyasu Nakano and Masataka Goto

Multi-scale design of interactive music systems: The libTuiles experiment 123

David Janin, Florent Berthaut and Myriam Desainte-Catherine

Real-time notation using brainwave control 130

Joel Eaton and Eduardo Miranda

Composing for cars 136

Adam Parkinson and Atau Tanaka

Downy Oak: Rendering ecophysiological processes in plants audible 142

Marcus Maeder and Roman Zweifel

The influence of graphical user interface design on critical listening skills 146

Josh Mycroft, Joshua D. Reiss and Tony Stockman

Discrete isomorphic completeness and a unified isomorphic layout format 152

Brett Park and David Gerhard

Amarok Pikap: Interactive percussion playing automobile 160

Selcuk Artut

Full automation of real-time processes in interactive compositions: Two related examples 164 *Javier Alejandro Garavaglia*

Mocap Toolbox - A MATLAB toolbox for computational analysis of movement data 172 *Birgitta Burger and Petri Toiviainen*

Relationships between spectral flux, perceived rhythmic strength, and the propensity to move 179 *Birgitta Burger, Riikka Ahokas, Aaro Keipi and Petri Toiviainen*

Programming interactive music scores with INScore 185

Dominique Fober, Stéphane Letz, Yann Orlarey and Frederic Bevilacqua

Real-time event sequencing without a visual interface 191

Tiago F. Tavares, Adriano Monteiro, Jayme G. A. Barbedo, Romis Attux and Jônatas Manzolli

Melody Bounce: Mobile rhythmic interaction for children 197

Stefano Baldan, Stefania Serafin and Amalia De Götzen

Plucking buttons: An alternate soft button input method on touch screens for musical interaction 201 *Edward Jangwon Lee and Woon Seung Yeo*

Robin: An algorithmic composer for interactive scenarios 201

Fabio Morreale, Raul Masu and Antonella De Angeli

x-OSC: A versatile wireless I/O device for creative/music applications 213

Sebastian Madgwick and Thomas Mitchell

The Airsticks: A new interface for electronic percussionists 220

Alon Ilsar, Mark Havryliv and Andrew Johnston

A computational method for exploring musical creativity development 227

Antonis Alexakis, Armen Khatchatourov, Angeliki Triantafyllaki and Christina Anagnostopoulou

The actuated guitar: A platform enabling alternative interaction methods 235

Jeppe Larsen, Dan Overholt and Thomas Moeslund

Komeda: Framework for interactive algorithmic music on embedded systems 239

Dariusz Jackowski and Krystian Baclawski

Sound Hunter developing a navigational HRTF-based audio game for people with visual impairments 245 $Sebastian\ W.\ Brieger$

Energy harvesting power flower bell – a cybernetic sound installation driven by a dirt-battery 253 *Josef Schauer, Winfried Ritsch and Lothar Fickert*

Artificial affective listening towards a machine learning tool for sound-based emotion therapy and control 259 *Alexis Kirke, Eduardo Miranda and Slawomir Nasuto*

Music performance 267

Modelling emotional effects of music: Key areas of improvement 269 *Tuomas Eerola* (invited)

Human-computer music performance: From synchronized accompaniment to musical partner 277 Roger Dannenberg, Nicolas Gold, Andrew Robertson, Zeyu Jin, Octav-Emilian Sandu, Praneeth Palliyaguru, Adam Stark and Rebecca Kleinberger

Conducting a virtual ensemble with a Kinect device 284

Alejandro Rosa-Pujazón, Isabel Barbancho, Lorenzo Tardón and Ana M. Barbancho

Virtual conductor for string quartet practice 292

Raquel Baez, Ana M. Barbancho, Alejandro Rosa-Pujazon, Isabel Barbancho and Lorenzo J. Tardon

Acoustic score following to musical performance with errors and arbitrary repeats and skips for automatic accompaniment 299

Tomohiko Nakamura, Eita Nakamura and Shigeki Sagayama

A contour-based jazz walking bass generator 305

Rui Dias and Carlos Guedes

LANdini: A networking utility for wireless LAN-based laptop ensembles 309

Jascha Narveson and Dan Trueman

Motion recurrence analysis in music performances 317

Euler Teixeira, Hani Yehia, Mauricio Loureiro and Marcelo Wanderley

Observed differences in rhythm between performances of classical and jazz violin students 323 *Enric Guaus, Oriol Saña and Quim Llimona*

Study of the tremolo technique on the acoustic guitar: Experimental setup and preliminary results on regularity 329

Sérgio Freire and Lucas Nézio

A preliminary computational model of immanent accent salience in tonal music 335

Richard Parncutt, Erica Bisesi and Anders Friberg

Expressive production of piano timbre: Touch and playing techniques for timbre control in piano performance 341

Michel Bernays and Caroline Traube

Composing social interactions for an interactive-spatial performance system 347

Adam Parkinson and Koray Tahiroğlu

How do people assess computer generated expressive music performances? 353

Sergio Canazza, Giovanni De Poli and Antonio Rodà

Towards computable procedures for deriving tree structures in music: Context dependency in GTTM and Schenkerian theory 360

Alan Marsden, Keiji Hirata and Satoshi Tojo

Situating the performer and the instrument in a rich social context with PESI extended system 368 $Callum\ Goddard\ and\ Koray\ Tahiroğlu$

Refined spectral template models for score following 376

Filip Korzeniowski and Gerhard Widmer

A history of sequencers: Interfaces for organizing pattern-based music 383

Raphael Arar and Ajay Kapur

Tale following: Real-time speech recognition applied to live performance 389

Jean-Luc Rouas, Boris Mansencal and Joseph Larralde

Technical report on a short live-action film whose story with soundtrack is selected in real-time based on audience arousal during performance 395

Alexis Kirke, Duncan Williams, Eduardo Miranda, Amanda Bluglass, Craig Whyte, Rishi Pruthi and Andrew Eccleston

Improving the real-time performance of a causal audio drum transcription system 402

Marius Miron, Matthew E.P. Davies and Fabien Gouyon

Creating expressive piano performance using a low-dimensional performance model 408 *Yupeng Gu and Christopher Raphael*

Skalldans, an audiovisual improvisation framework 415

PerMagnus Lindborg

Network music with Medusa: A comparison of tempo alignment in existing MIDI APIs 419 *Flávio Schiavoni, Marcelo Queiroz and Marcelo Wanderley*

mono2eN: A multi-channel autospatialisation performance system 425 *Callum Goddard*

Modeling and Simulation: The Spectral Canon for Conlon Nancarrow by James Tenney 431 *Charles de Paiva Santana, Jean Bresson and Moreno Andreatta*

Capacitive left hand finger and bow sensors for synchronization and rhythmical regularity analysis in string ensembles 438

Tobias Großhauser, Sebastian Feese and Gerhard Tröster

Acoustic retroreflectors for music performance monitoring 443

Heikki Tuominen, Jussi Rämö and Vesa Välimäki

Mixing symbolic and audio data in computer assisted music analysis: A case study from J. Harvey's Speakings (2008) for orchestra and live electronics 448

Stéphan Schaub, Ivan Simurra and Tiago F. Tavares

Brazilian challenges on network music 453

Julian Jaramillo Arango, Marcio Tomiyoshi, Fernando Iazzetta and Marcelo Queiroz

Sonic interaction design 461

Sonification and auditory displays in electronic devices 463 *Bruce N. Walker* (invited)

Controlling a sound synthesizer using timbral attributes 467

Antonio Pošćić and Gordan Kreković

A quantitative review of mappings in musical iOS applications 473

Thor Kell and Marcelo Wanderley

Acoustics-like dynamics in signal-based synthesis through parameter mapping 481

Brendan B. Gaffney and Tamara Smyth

Real, Foley or synthetic? An evaluation of everyday walking sounds 487

Amalia de Götzen, Erik Sikstöm, Francesco Grani and Stefania Serafin

Urb: Urban sound analysis and storage project 493

José Alberto Gomes and Diogo Tudela

Non-realtime sonification of motiongrams 500

Alexander Refsum Jensenius

Impulse response estimation for the auralisation of vehicle engine sounds using dual channel FFT analysis 506 Simon Shelley, Damian Murphy and Simon Goodwin

Image sonification using local keypoint features 512

Keunhyoung Luke Kim and Woon Seung Yeo

Real-time hallucination sonification and simulation through user-led development of an iPad augmented 517 reality system

Alexis Kirke, Joel Eaton and Eduardo Miranda

Sound processing 523

Spectral distortion using second-order allpass filters 525

Greg Surges and Tamara Smyth

Multichannel control of spatial extent through sinusoidal partial modulation (SPM) 532

Andres Cabrera and Gary Kendall

Real time digital audio processing using Arduino 538

André J. Bianchi and Marcelo Queiroz

Audio interpolation and morphing via structured-sparse linear regression 546

Corey Kereliuk, Philippe Depalle and Philippe Pasquier

Warped frames: Dispersive vs. non-dispersive sampling 553

Gianpaolo Evangelista

Improved polynomial transition regions algorithm for alias-suppressed signal synthesis 561

Dániel Ambrits and Balázs Bank

Towards a discrete electronic transmission line as a musical harmonic oscillator 569

Kurijn Buys and Roman Auvray

Solving interactions between nonlinear resonators 576

Joël Bensoam and David Roze

An energy conserving finite difference scheme for simulation of collisions 584

Vasileios Chatziioannou and Maarten van Walstijn

On finite difference schemes for the 3-D wave equation using non-Cartesian grids 592

Brian Hamilton and Stefan Bilbao

Automatic tuning of the OP-1 synthesizer using a multi-objective genetic algorithm 600

Matthieu Macret and Philippe Pasquier

An open-source framework for time-domain simulations 608

Clemens Geyer and Wilfried Kausel

Auralization of coupled spaces based on a diffusion equation model 616

Paul Luizard, Jean-Dominique Polack and Brian F.G. Katz

Warped low-order modeling of musical tones 622

Rémi Mignot, Heidi-Maria Lehtonen and Vesa Välimäki

Four-part harmonization using probabilistic models: Comparison of models with and without chord nodes 628 *Syunpei Suzuki and Tetsuro Kitahara*

A versatile toolkit for controlling dynamic stochastic synthesis 634

Gordan Kreković and Davor Petrinović

Visions of sound: The Centro di Sonologia Computazionale, from Computer Music to Sound and Music Computing 639

Sergio Canazza, Giovanni De Poli and Alvise Vidolin

Smoothness under parameter changes: Derivatives and total variation 646

Risto Holopainen

Audio restoration of solo guitar excerpts using a excitation-filter instrument model 654

Juan Parras-Moral, Francisco Canadas Quesada, Pedro Vera Candeas and Nicolas Ruiz Reyes

Spatium, tools for sound spatialization 660

Rui Penha and João Pedro Oliveira

Dynamic FM synthesis using a network of complex resonator filters 668

Julian Parker and Till Bovermann

Reconfigurable Autonomous Novel Guitar Effects (RANGE) 674

Duncan MacConnell, Shawn Trail, George Tzanetakis, Peter Driessen and Wyatt Page

Music information retrieval 679

PHENICX: Performances as Highly Enriched aNd Interactive Concert Experiences 681

Emilia Gomez (invited), Maarten Grachten, Alan Hanjalic, Jordi Janer, Sergi Jordà, Carles F. Julià, Cynthia Liem, Agustin Martorell, Markus Schedl and Gerhard Widmer

Semi-automatic melody extraction using note position and pitch information from users 689 *Antti Laaksonen*

Joint fo and inharmoncity estimation using second order optimization 695

Henrik Hahn and Axel Röbel

Large data sets & recommender systems: Feasible approach to learning music 701 *Iamie Gabriel*

Comparing timbre-based features for musical genre classification 707

Martin Hartmann, Pasi Saari, Petri Toiviainen and Olivier Lartillot

Similarity search of Freesound environmental sound based on their enhanced multiscale fractal dimension 715 *Motobiro Sunouchi and Yuzuru Tanaka*

Using semantic layer projection for enhancing music mood prediction with audio features 722

Pasi Saari, Tuomas Eerola, György Fazekas and Mark Sandler

Beat-Station: A real-time rhythm annotation software 729

Marius Miron, Fabien Gouyon, Matthew E.P. Davies and Andre Holzapfel

Modelling perception of speed in music audio 735

Anders Elowsson and Anders Friberg

Global key extraction from classical music audio recordings based on the final chord 742 *Christof Weiss*

PEVI: Interface for retrieving and analyzing expressive musical performances with scape plots 748 *Shota Miki, Takashi Baba and Haruhiro Katayose*

Segmentation and Timbre Similarity in Electronic Dance Music 754 Bruno Rocha, Niels Bogaards and Aline Honingh

Melodic outline extraction method for non-note-level melody editing 762 *Yuichi Tsuchiya and Tetsuro Kitahara*

SoundAnchoring: Content-based exploration of music collections with anchored self-organized maps 768 *Leandro Collares, Tiago Tavares, Joseph Feliciano, Shelley Gao, George Tzanetakis and Amy Gooch*

SmartDJ, an interactive music player for music discovery by similarity comparison 776 $Maureen\ Aw$, $Chung\ Sion\ Lim\ and\ PerMagnus\ Lindborg$

Sound analysis based on phase information that connects time and frequency 782 Peter Pabon and Jordy van Velthoven

Author index 789