News

DAFx 2019

The 22nd International Conference on Digital Audio Effects (DAFx) met 2–6 September 2019 at Birmingham City University, UK. The conference program included oral and poster presentations of accepted papers, tutorials, and demonstrations. Keynote lectures were given by Jesse Engel, presenting an overview of Google's Magenta research project for creative applications of machine learning; by Paul Weir, who discussed the use of generative and procedural audio technology in his musical works; and by Masataka Goto, presenting intelligent musical interfaces that utilize signal processing and machine learning. Paper presentations were broadly divided into topics of digital signal processing, sound synthesis, deep learning for sound synthesis, deep learning for audio effects, virtual analog processing, and spatial audio. Research presented at DAFx included a novel machine-learning technique for representing the parameter space of a digital synthesizer, the use of recurrent neural networks for removing reverberation from an audio signal, and the exploration of the parameter space of chaotic oscillators. Other research presented included a recurrent neural network for modeling nonlinear effects such as tube distortion, a method for encoding first-order Ambisonics audio signals, and a new form of synthesizing velvet noise.

Web: dafx2019.bcu.ac.uk

Web Audio Conference

The fifth Web Audio Conference (WAC) was held 4–6 December 2019 at the Norwegian University of Science and Technology in Trondheim, Norway. WAC is an international conference dedicated to Web audio technologies in addition to the development, design, evaluation, and standardization of emerging audio-related Web technologies such as the Web Audio API, WebRTC, WebSockets, and JavaScript. WAC 2019 welcomed Web developers, music technologists, artists, software designers, industry engineers, researchers, students, and others interested in the fields of Web development, music technology, computer music, audio applications, and Web standards.

The 2019 edition of WAC included presentations of research papers related to Web-based audio technologies as well as research demonstrations, installation works, concerts, and keynote talks. Presented research included a recommendation engine for a Web-based digital audio workstation, a Web-based implementation of the TidalCycles programming language for musical live coding, and the use of networked music performance to enable musical ensemble activities for socially isolated individuals. Among other research presented at WAC 2019 were the composition of spatial music using Web-based virtual reality, plug-in development for Web Audio, and a digital audio workstation enabling real-time musical collaboration. Keynote presentations were given by Rebekah Wilson, who talked on the development of musical fluency in latency inherent in networked music performance, and Norbert Schnell, who identified notions of exclusion in computer music performance and the potential of Web technologies to remediate these concerns.

Web: ntnu.edu/wac2019

Linux Audio Conference

The 17th Linux Audio Conference (LAC) took place 23–26 March 2019 at Stanford University in Stanford, California. LAC is the international conference focused on free and open-source software for music, sound, and other media with Linux as a primary computing platform. LAC 2019's program included paper and poster presentations, demonstrations, workshops, installations, and concerts with this focus in mind. Research discussed at LAC 2019 included acceleration of digital waveguide computation using graphical coprocessors, high-level encodings of mass-interaction physical modeling in the FAUST programming language, and a musical robotic companion utilizing open-source technologies to generate musical output and physical gestures in response to analysis of speech input. Among other papers presented at the conference were a new software library for sequencing generative music, an extension to the JACK audio server to synchronize manifold audio streams over wide area networks, and a programming framework for data sonification using the Web Audio API.

Web: lac.linuxaudio.org/2019

Matera Intermedia Festival

The 2019 Matera Intermedia Festival of electroacoustic music and digital art was held 14–15 and 21–22 September 2019 in Matera, Italy. The festival comprised four evenings of concerts of acousmatic music, mixed media works, audiovisual works, and live performance. The festival granted awards of distinction in three of these four categories, with Daniel Blinkhorn's *Valiha* winning in the acousmatic category, Panayiotis Kokoras' *Rhino* and Cesare Saldicco's *Spire VII* both winning in the mixed media category, and Peter van Haaften and Michael Montanaro's *SPIEL* winning in the live performance category. In addition to the concert programming, sound art works were exhibited throughout the festival. Among these,

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Ludger Brümmer, Yannick Hofmann, Dan Wilcox, and Tomasz Ciotucha's *NCS_HYPOGEAN CITY* made up a series of spatialized electroacoustic miniatures placed throughout Casa Cava, Matera's unique cultural space built into a former stone quarry.

Web: materaintermedia.it/main-2019

Future of Audio in Virtual Reality

The Future of Audio in Virtual Reality workshop met 24 March 2019 in Osaka, Japan. Part of the 2009 Institute of Electrical and Electronics Engineers (IEEE) Virtual Reality (VR) conference, the workshop sought to consider the multifaceted role of audio in virtual reality given expanding degrees of access to virtual experiences available to both researchers and consumers. The aims of the workshop were to highlight recent developments in VR audio and identify needs of the VR community in creating compelling virtual auditory experiences. In addition to demonstrations and a group discussion, the workshop featured a series of research presentations. These included considerations for designing interactive VR audio tools, a discussion of issues related to audio reproduction in virtual cinema environments, and models of both collaboration and competition for music making in virtual reality.

Web: favr2019.github.io

Audio Developer Conference

The Audio Developer Conference (ADC) took place 18–20 November 2019 in London, UK. ADC 2019 encompassed talks, workshops, poster presentations, panel discussions related to audio software development. Keynote speakers included François Pachet, who discussed his efforts to create music using artificial intelligence; Imogen Heap, covering her use of interactive gloves in live music performance; Julian Storer, relating the practice of programming to models of the human mind; and Gerhard Behles, discussing the history and context of Ableton and its Live music software. Other talks covered design and implementation of deep learning for music software, approaches to multithreading in audio software design, and the use of Web-based programming frameworks to develop real-time audio plug-ins. Workshops in the ADC covered developing a synthesizer in the SOUL programming language, deep learning for speech synthesis, and an introduction to audio signal processing. A series of panel discussions focused on the design of music software interfaces, mobile music making in the production studio environment, and machine learning for music.

Web: juce.com/adc

NowNet Arts Conference

The 2019 NowNet Arts Conference was held 7–10 November 2019 at the Institute for Advanced Computational Science in Stony Brook, New York. The conference is an annual event for artists, technologists, researchers, educators, and industry professionals advancing topics in contemporary network arts to discuss ongoing development of the field. The conference's theme, "Social Purpose in Contemporary Network Arts," is intended to denote the ability of networked performance to achieve social goals such as raising environmental awareness, promoting diversity, and advocating peaceful resolutions to conflict. In addition to the main site of the NowNet Arts Conference in Stony Brook, several satellite locations were connected via networked audio and video connections, allowing conference attendees to participate virtually from Stanford University, Technische Universität Berlin, Edinburgh Napier University, and the Orpheus Institute in Ghent, Belgium. The conference included presentations of technical and artistic research, such as proposed methodologies for documenting immersive and multisensory art, a study of collaborative musical instruments shared by performers over a network connection, and the use of networking technologies to connect six conservatories in a virtual collaborative setting. Also featured were several concerts of telematic music, included a telematic rendition of Karlheinz Stockhausen's *Solo* (1965–1966). The conference also hosted a launch event for the *Journal of Network Music and Arts*, a new peer-reviewed open access digital research journal published by Stony Brook University.

Web: nownetarts.org/conference-2019

Workshop on Computer Music and Audio Technology

The 2019 International Workshop on Computer Music and Audio Technology (WOCMAT) took place 13–14 December 2019 at National Tsing Hua University in Hsinchu City, Taiwan. The conference is held annually with the goals of disseminating new advances in audio technology and exhibiting of new forms of music. The conference featured several invited talks and keynotes as well as paper presentations and concerts. Among the keynote presentations, Elaine Chew discussed computational analysis of musical performance and Marc Battier talked on interactions between music and science from a historical perspective. Paper topics at WOCMAT included approaches to

music therapy based in cognition research and neuroscience, automated notation of complex rhythms, and the use of artificial intelligence (AI) techniques to develop a new musical instrument. A panel discussion among the conference's keynote presenters and invited speakers focused on the growing relationships between music and AI. The conference also featured a ceremony to confer the International Electroacoustic Music Young Composer Awards, with Patrick Hartono's *The Return* (first movement) winning first prize in the Electronic Art Music category and Hsiao Ti Wang's *National Palace Museum* winning first prize in the Applied Music category.

Web: lewis841214.github.io /WOCMAT2019.github.io