EDITORIAL

This edition of *Organised Sound* focuses on Networked Electroacoustic Music and Internet2. The journal has regularly covered networked music in the past, including a themed issue (10/3, 2005). More recently the topic, including audio interchange, has been documented in forums such as *Contemporary Music Review* (28/4, 2009).

The early use of networks to make music has been well covered theoretically by writers such as Weinberg (2005), Barbosa (2003) and Föllmer (2005). While this early theoretical work can be drawn on to come to terms with the new space, the synchronous use of data, audio and visual exchange over networks is far from being fully explored conceptually and aesthetically. Moreover, the early resistance of the medium has since given way to a thriving practice of synchronous sonic and multimedia experimentation over high-speed research networks. Accordingly, this *Organised Sound* issue aims to document and discuss the latest perspectives gained from a body of practice-led work.

In the original call for works, initial questions included: are there new issues in aesthetics to be addressed in electroacoustic music as mediated by networks? What practices and roles are being transformed and/or re-interpreted as a consequence? What are the most significant new outcomes or processes? What are the current research questions that need to be explored? As the diffusion of multi-channel audio set an agenda for a generation of electroacoustic music, will geo-diffusion be a new benchmark? The articles within explore different aspects of the topic.

Network music poses particular problems for electroacoustic music practice, because a good proportion of conventional works are still grounded in iterative editing techniques and fixed playback. More dynamic aspects of the field, such as the proliferation of laptop 'orks', while steadily replacing audio cables with Ethernet cables, still tend to be LAN-centric. A central issue is then what aspects of the latest initiatives in social computing extend well to distributed WAN practices, and what aspects of the practice break down.

Like many areas in electroacoustic music exploration, coming to terms with this area requires a careful balance and synthesis. In general, after first having acquired a working knowledge of the possibilities of innovative technologies, one then needs a sense of how these might be applied experimentally in composition and portrayed conceptually to move forward or change established practices.

Beginning from a wide theoretical discussion in 'Internet2 and Global Electroacoustic Music: Navigating a decision space of production, relationships and languages', Ian Whalley maps a multi-dimensional range of choices to be made by practitioners working in the medium. He argues that through audio performance, supported by digital video communication between players, the idiom provides the opportunity for networked electroacoustic music practitioners to connect with, bridge, amalgamate and lead diverse sound-based music traditions. His work also includes provision for amalgamating work in intelligent/multi-agent software to facilitate new hybrid sonic art forms. However, he notes that while Internet2 expands production/aesthetic possibilities, accommodating established aesthetics in tandem requires careful consideration, and suggests a method for this.

Exploring this new space, Roger Mills and Kirsty Beilharz in 'Listening Through the Firewall: Semiotics of sound in networked improvisation' argue that while high-speed broadband enables synchronous networked improvisation globally, nuances of face-to-face communication such as gesture, facial expression and body language are not available to the remote improviser. Accordingly, they note that listening and the semiotics of sound mediate sonic artists' interaction and the resulting collaboration. This paper examines two case studies of networked improvisatory performances by the inter-cultural tele-music ensemble Ethernet Orchestra.

Nicolas Makelberge next contributes 'Rethinking Collaboration in Networked Music'. The argument is that the current Internet sampling culture, emerging from pioneering efforts in electroacoustic music in the 1950s, exemplifies a general historical trend of advances in music instrumentation toward the provision of greater autonomy for the musician. This is a central concern of network music researchers, who place varying emphasis upon reciprocity and group dynamics. By looking into what sets collective creation apart from collaboration and cooperation, and elaborating the social aspects of music-making, he attempts to shed light on a practice of accessing, shaping and sharing music in solitude.

In an applied vein, Lauren Hayes and Christos Michalakos in 'Imposing a Networked Vibrotactile Communication System for Improvisational Suggestion', outline the implementation of NeVIS, a local network system that establishes communication

between individual performers as well as between laptop and performers. This involves a cueing system or framework imposed over the improvisation and transmitted directly to the skin of the performers via tiny vibrations. This echoes Mills and Beilharz's paper on the need for compensating for lack of visual cues between network performances. The paper discusses current developments in the use of networks for improvisation, and the benefits of making use of the haptic feedback channel as a sensory information pathway when performing digital music. A case study of the system's use by computer-mediated improvisational duo Můstek is presented.

'Network Socio-Synthesis and Emergence in NOMADS' (Network-Operational Mobile Applied Digital System) by Matthew Burtner, Steven Kemper and David Topper continues the applied focus in a paper that discusses a network client–server-based system for participant interaction in music and multimedia performance contexts. Their approach allows large groups of participants (including an audience) to form a mobile interactive computer ensemble distributed across a network. Through this, participants become part of a synergistic interaction with other performers, contributing to the multimedia performance. NOMADS enhances local performance spaces and can integrate audiences located in multiple performance venues. Thousands of simultaneous users across a network can be synthesised into a single emergent sound and visual structure in an approach they term socio-synthesis. Their offering recounts research leading up to NOMADS, outlines its technological architecture, and describes several implementations.

David Ogborn in 'Composing for a Networked Pulse-Based Laptop Orchestra' has been guided by the idea of participatory culture. Networked pulse synchronisation and live coding have been core approaches in the activity of the Cybernetic Orchestra – an electronic performance ensemble at McMaster University in Hamilton, Canada. Following a general discussion of the way in which networked pulse-based music and live coding work within this orchestra, there is specific discussion of a number of compositional models and practices that have been found effective, including code-sharing, instruction-scores, code as material, and physical performance.

Integrating a wide number of concerns in the field, Owen Vallis, Dimitri Diakopoulos, Jordan Hochenbaum and Ajay Kapur offer 'Building on the Foundations of Network Music: Exploring interaction contexts and shared robotic instruments'. The Machine Orchestra (TMO), it is argued, extends the historical idea of musical interconnection by developing a custom software suite called Signal. The Signal system is a framework for musical synchronisation and data-sharing, designed to support the use of musical robotics, in an attempt to address ideas of interconnection

and embodied performance. The authors consider the potential of large-scale human–computer ensembles as a paradigm for composition and performance, as exemplified by current applications including the telematic opera *Auksalaq* and performances by the MICE Orchestra.

Bruce Gremo in 'Tele-media and Instrument Making' discusses the concept of building tailored instruments for tele-media. He begins with an analysis of the control domains of acoustic instruments and digital controllers, noting that the design criteria for tele-media instruments are formulated by this but also from a consideration of the capacity of tele-media to bring together multi-lateral non-proximate control sources. He notes that high standards of instrument-making urge tele-instrumentation to facilitate virtuosic performance, as virtuosity can be understood as an essential aspect of performance presence. He also argues that transmission of performance intention is more important to remote performance presence than literal representations of musicians on stage, and that performance presence can be facilitated by interactive graphic notation that dynamically renders control domain data into images.

Finally, Ken Fields in 'Syneme: Live' argues that network music puts a focus on the materials and processes of communication and repositions acousmatic and other strata of electroacoustic music practice. He puts forward the notion of chronotopes (literally time/space) as a way to frame the requisite relationships of latency that are the defining attribute of network music interaction. Fields' narrative picks up from where high-speed P2P networking crosses a threshold, producing a successor to Internet music, and highlights discourse on mediated liveness that harkens back to the early promise of live television and radio spectacle. The article includes an overview of a three-year project investigating music performance over high-speed research networks funded by the Canada Research Chair programme.

With the increasing ubiquity of high-speed Internet, this new space is one that a contingent of electroacoustic music practitioners will be compelled to come to grips with – particularly those who regard technology as a non-neutral component or actor. The sense here is that we are only beginning to discover an adequate perceptual or cognitive framework for tele-musical events, aesthetics and philosophical approaches. This collection is then a small contribution toward grappling with this new area to extend aspects of electroacoustic musicianship.

Ian Whalley
(musik@waikato.ac.uk)

Ken Fields
(kfields@ucalgary.ca)

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