HELOPG, LESSONS LEARNED (SO FAR)

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ABSTRACT

A review of how the Huddersfield Experimental Laptop Orchestra Postgraduate Group (HELOpg) has developed its current methodology and practice through performance and collaboration since November 2009 through a consideration of the groups chosen approach to software, hardware and sound-reinforcement strategies as developed in and informed by:

- (1) regular weekly rehearsal; (2) various performances in different settings; (3) recent recording sessions

- divergence from more common laptop orchestra approaches

- defensive methods to ensure performance capability even through device failure

Building on lessons learned (so far), HELOpg outline how their practice might inform the development of innovative models for improvisation which, whilst affording further player interaction, will not affect each individuals conceptual and sonic identity. HELOpg also introduce the SLIME System, a new methodology being developed by the group for use in networked performance.

1. HELOPG SO FAR

Since 2009 and based at the University of Huddersfield (UK), HELOpg operates as a non-unified laptop ensemble. We have deliberately chosen to avoid the development of a meta-instrument structure, opting rather to promote each individuals preferences for creative praxis. We concentrate on creating and exploring individually designed laptop interfaces which are, inevitably, devoid of a common hardware or software architecture.

At the time of its inception there was agreement that this new postgraduate laptop ensemble should reflect in its title a connection to the already established Huddersfield Experimental Laptop Orchestra (HELO). Following the precedent of object oriented programming languages, the name HELO.pg was proposed and adopted. The inclusion of a dot character in the name, however, proved to be problematic in a number of ways, not least the false identification of it by web technologies as an URL (this despite .pg at the time being unobtainable as a top level domain). A prolonged period of discussion eventually led to the group adopting its title in the present form[1].

The question of name has also been a reoccurring one because HELOpg has often been erroneously described in programme notes and gig promotion materials by text which describes the undergraduate directed ensemble. The HELOpg online documentation was, at first, found within the HELO wiki [2] which has compounded confusion. We now maintain our own site [3] with a blog which has mirrored the older wiki entries.

Given their entwined histories and location, it is unsurprising that there are a number of ways in which HELOpg is in some senses similar to HELO, particularly in its hardware and software choices [4]. In contrast to the undergraduate HELO, HELOpg has had a much smaller and more stable community over its years of activity, and we have found the band-like camaraderie developed by this to have enhanced our conceptual flexibility and fluidity within the execution of an experimental improvised performance practice. We strongly believe that this emergent methodology, embracing diversity and self-directed-ness along with collective goals, fosters an interaction based on cooperation, listening and an optimal immersed flow experience [1] leading to a greater understanding between the performers during performance.

2. ARCHITECTURE

The architectural organisation of HELOpg, in terms of software and hardware, is not fixed. Each individual performance system is subject to change, and the technologies employed to combine the group alter in accordance with that and the particular motivations of the situation. As the ensemble has an active interest in electronic experimentation, an eclectic mix of hardware and software elements are employed in practice, and different sound reinforcement techniques have been explored.

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[1] HELOpg (hiːləʊpiːdʒiː)
[2] helo.ablelemon.co.uk/pg
[3] helopg.co.uk

The groups approach to organisational choices is broadly thus:

- Solutions must be low-impact by being simple and practical.

- In terms of both software and hardware the implication is for innovation to not get in the way of players regular performance setup.

- Preference is shown to software solutions that are cross-platform and promote freedom of access.

2.1. Software

Various Linux, Mac, and Windows operating systems are used with multiple softwares including, but not limited to, Chuck, Hydrogen, Max, Pd, and ReNoise. Generally, for each individual group member, small sets of custom designed or heavily tweaked code have become standard or best practice for use within performance. Live-coding is common within HELOpg performances, as are techniques which extract and utilise data from the environment in real-time. The groups potential for dynamic and varied sounds within any performance is expanded when each performer has their own customized software environment, in contrast to situations where an entire ensemble has a unified software interface.

From a pedagogical perspective, we all agree on the importance of understanding the fundamentals of the DSP-related task rather than relying on any particular software solution. The software specific methods of an individual are mostly of little collective concern: the emphasis is always upon the audible. Specific methods are often, however, of interest within the group.

2.2. Hardware

As with the software employed by the group, so the hardware is non-uniform across members, and the specifics change over time. Laptop, net-book, and touch-screen devices from Apple, IBM/Lenovo, Samsung, and others have been used, along with audio-interface and other peripherals from Novation, MOTU, M-Audio, Griffin and many others. Analog electronics, such as mixers and transducers of various types, are frequently included within individual and combined setups. HELOpg has recently experimented with approaches to some networked performance situations which has meant, in terms of hardware, the occasional inclusion of a router to facilitate a local area network. For upcoming internet-mediated performances, HELOpg will use an audio mixer to create a stereo mix which will go to the audio-interface of a desktop computer which is connected to computers elsewhere.

2.2.1. Telephones and Tablets

A discussion within the group took place recently on the appropriateness of phones and tablets for a laptop ensemble. Again, hardware choice is a matter of personal taste, and the question is highly dependent on context of use: is the phone or tablet an addition to a laptop interface? If not, then can a phone or tablet be considered as equivalent to a laptop? Can its software be (re)programmed upon the device itself? The group are still in the process of debating and exploring these possibilities.

2.3. Sound Reinforcement

2.3.1. Combined Amplification

For pragmatic purposes, and following common standard practice in various types of performance situation, HELOpg currently tends to present a single stereo mix of each performers audio output. Depending on the hardware involved in a particular environment, ensemble members often choose to utilise an alternative sub-mix as input to their own laptop (such as via aux sends from a centralised mixer) in order to process the audio output of performers.

It is often preferable to use the main stereo rig for monitoring during performance, as this way individual group members are listening to the same loudspeakers as everyone else [4]. We are each accustomed to listening to stereo mixes of music and find contributing to one such mix in real-time a natural way to perform as HELOpg. Over time, and having previously experimented with a number of other forms and methods, this method of combined amplification has become the groups favoured option.

2.3.2. Acoustic and Extended Amplification

Some early compositions and performances focused upon acoustic performance, inspired by the practise of groups such as Powerbooks Unplugged [5]. Here acoustic refers to the sole use of the laptops internal speakers to produce sound. Moving on from the acoustic, for over a year our preferred amplification was cheap guitar amps. Mono, noisy, and with narrow frequency bandwidths, these amps allowed for portability (e.g. getting to gigs on the train), durability and were inexpensive to maintain. In comparison with the acoustic approach, the use of a guitar amp extends the range of a laptop in terms of volume and low frequency response. The restrictions implied by these types of amplification models have led to novel performance implementations where the inherent bounding has became a part of the conceptual improvisational soundscape. The next step in extended amplification, for up to four performers, is available within the

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[4]The physical stage layout required to achieve this also place the ensemble within the audience space allowing audience members to inspect the players screen; this behaviour is actively encouraged by the ensemble.

HISS [5] with the Bose L1mk2 system. As an extension of the guitar amp model, these Bose units provide a by comparison hi-fi solution to laptop sound reinforcement.

3. RECORDING SESSIONS

Working towards an album intended as a document of our practice at the time, each of these recording sessions captured performances of durations ranging from three to thirty-plus minutes. A number of dedicated workshop/recording sessions were also held in June 2011 for the rehearsal and recording of compositions by Julian Brooks [6].

3.1. Recording Methodology

For the recording of the improvised performance sessions, stereo outputs from each laptop instrument were routed to both a multitrack recorder and, usually, to a single stereo mix for amplification within the studio. The use of stereo sum monitoring reflects common practice employed in live performance, but the extended amplification model was revisited when recording in an eight channel surround sound studio. In both cases, the separately routed multitrack recording of individual stereo outputs allows for the relative levels in the mix to be altered post performance. Indeed, the inherent isolation between the performers in this kind of recording provides opportunity for analysis and creative post production.

For the Brooks composition recordings later in the year, sessions were conducted in the eight channel studio, monitoring without summing so that each performer had either one or two speakers for their output in isolation. Though making no obvious changes in their audition, the different methods explored have subtle implications for the groups performances and output. Choice of methodology is likely to depend on interpretation, requirements and desired outcome. As a group, HELOpg strives to support each individual in pursuing their own interests within a cooperative and supportive setting.

Possibilities for alternative recording methods have been discussed. The potential of going via amps and then microphones was rejected because the fidelity offered by direct recording of outputs is such an advantage. Other laptop ensembles are likely to adopt studio methods that reflect their own performance practice, as have HELOpg.

3.2. Mixing Methodology

Due to the documentary nature of these initial recording sessions, post production has been limited to only minor edits and subtle spectral modifications akin more to mastering, than mixing. It is however intended to undertake a studio album project to fully exploit the creative potential of the studio.

4. LIVE PERFORMANCE

Up to February 2012, HELOpg has performed at 15 public events; details and recordings of these can be found online[7].

4.1. Defensive Methods

Emergent through practice as much as by design, HELOpg has developed defensive methods to ensure performance capability. When systems are experimental, there is a definite chance of failure within performance. HELOpg nurture awareness of knowable limitations and potential hazards, so that risk taking is offset by confidence stemming from tried and tested praxis. By avoiding any centralised control, particularly within network synchronisation, no one piece of equipment failure can crash the overall system. The commodity hardware approach, combined with open source software facilities the quick exchange of hardware if disaster strikes. To this end some players maintain Git repositories, or use Dropbox[8], so that the individual software performance environment can be cloned onto another computer.

4.1.1. Interface Simplification

As argued by [3], the standard laptop interfaces of keyboard and mouse or trackpad offer a rich variety of controllers and a consistent and easily replaced performance interface. Laptop keyboards are often represented as monolithic entities. Our experience shows that the laptop keyboard as interface has many different layouts, feels, and designs. It is also something that we are all well practised upon, spending a good portion of our time interacting with computer keyboards in the everyday. Rather than representing a soft interface, we would suggest that the laptop keyboard is in fact well suited to live electronic music, and that there is generally no need for us to expand or extend our controller options. Whilst some group members have opted to augment their laptop performance interface (for example, through the use of a volume control foot pedal), these additions are designed to be easily replaced and are not viewed by all group members as necessary. HELOpg very much favour the sentic approach (see [2]) where the most complex and detailed of expression may be contained within the slightest touch.

4.2. SLIME System

Inspired by images of the League of Automatic Music Composers the SLIME System [9] links many laptops into a single

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[5] http://www.thehiss.org/
[6] http://helopg.co.uk/2011/09/22/recent-text-score-recordings/
[7] http://helopg.co.uk/category/performances
[8] http://dropbox.com
[9] First used in performance at the Network Music Festival, Birmingham, January 2012.

instrument for collaborative group performance. This move toward a modal of singularity might appear as contrary to the described ethos of the group, but it stems from, and seeks to extend, the established methodology.

It has been our experience that, within the performance event and for all ensemble members, there is an occasional urge to sync/merge further into the emergent soundworld, for example by sharing various forms of real-time meta-data in addition to sub-mixing audio between laptops. To explore new territory in this direction, HELOpg have recently explored the formation of new software and strategies for ensemble performance within laptop improvisation.

While the group chooses to remain non-standardized in terms of the hardware and software of each laptop-instrument, the adoption of shared systems for integration and interaction will create new opportunities for laptop orchestra performance.

Development of the SLIME System, and the source of its acronym, began with the conception of an *interactive laptop network sound system* under the title *Metacosm*. In addition to solutions for audio routing (based on Hewitts Net-Mixer) and the Open Sound Control [6] protocol for communication (in terms of message structure and UDP addressing), the SLIME System aims to challenge the one-to-one performer-to-laptop ratio paradigm. Rather than viewing SLIME as a network of discrete laptop instrument systems, the idea is for hardware and software to interconnect in such a way that control data is distributed throughout the collective which one might then view as a single entity. With this objective the challenge is then to maintain a practice that aims to ensure performance capability: it cannot be that the whole structure is doomed to fall apart in the event of one machine failing.

Each perceived lack in current group practice has led to the creation of new compositional material as well as code. In this way, SLIME presents new opportunities for compositional strategy, both as a method for generating material and as a conceptual framework for musical interaction with both many-to-one and one-to-many dynamism.

The SLIME System network diagram (Figure 1) shows connections of a hypothetical laptop ensemble using the SLIME System. In this example, an extended amplification model of sound reinforcement is implied.

As the system continues to be developed, further information will be added to the HELOpg website[10]. More details about the group's recordings and performance schedule are also available on this site.

5. ACKNOWLEDGEMENTS

Figure 1. SLIME System example
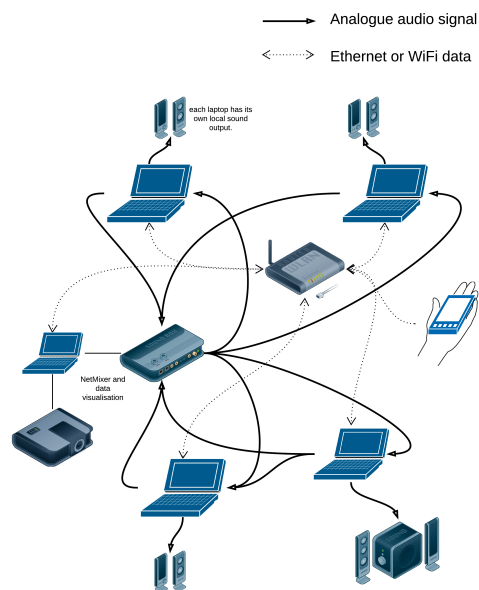
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[10]http://helopg.co.uk/projects/slime-system/