Slippery Chicken
algorithmic compositions by Michael Edwards

"Formerly, when one worked alone, at a given point a decision was made, and one went in one direction rather than another; whereas, in the case of working with another person and with computer facilities, the need to work as though decisions were scarce – as though you had to limit yourself to one idea – is no longer pressing. It's a change from the influences of scarcity or economy to the influences of abundance and – I'd be willing to say – waste." John Cage

As your old maths teacher said about numbers, algorithms are nothing to be scared of. Following Descarte's principle of solving difficult problems by dividing them into smaller, more manageable ones, an algorithm is merely a step-by-step procedure aimed at solving a particular problem. The gap between imagining a new piece of music and realising it in score or any other format is often bridged by composers in an algorithmic manner, whether explicitly or not. Algorithmic composition formalises this process and makes it explicit. It usually involves the use of a finite set of step-by-step procedures, most often encapsulated in software routines, to create music. All the works on this release, for example, were created by the author with his algorithmic composition software, *slippery chicken* (www.michael-edwards.org/sc).

The formalisation of musical composition is nothing new. Bach's fugues can be analysed in terms of their algorithmic properties. Going further back, to around 1026, Guido d'Arezzo, the inventor of modern staff notation, developed a formal technique to set a text to music. A pitch was assigned to each vowel so that the melody varied according to the vowels in the text. But the beginnings of algorithmic composition can be traced even further back, to the ancient Greeks and the Jewish Kabbalah.

What would be the motivation to make music algorithmically? The explanation lies at least partly in the cognitive processes involved in experiencing music. As we listen, we are not merely enjoying the sensual sonic experience of the moment but setting up expectations of what is to come based on what has already occurred, not only in the music we are listening to but in other pieces we know that are similar to it, as well as all the music we have heard thus far in our lives. Essentially, using our memory and predictive faculties, we listeners create musical architecture in our brains, and the more actively we listen, the more elaborate that architecture becomes. For centuries then, composers have taken advantage of this ability to build sonic-structural relationships in time in order to formalise the compositional process.

Formal planning cannot be conflated with algorithmic techniques of course, but that the former should lead to the latter was a historical inevitability. The potential for software algorithms to enrich our musical culture has been established, in the 50+ years since such techniques were first introduced, by personalities as diverse as Hiller, Xenakis, Cage, and Eno. There are many riches to be mined in algorithmic composition as, amongst other benefits, the expression of compositional ideas in software often leads to unexpected and exciting results, and these can seldom be achieved via traditional means. Algorithmic composition techniques can thus play an energising role in the development of modern music across all genres and styles.

slippery chicken can be seen as a bridging technology. Traditional composition training in the West does not usually include algorithmic or computer music techniques, despite the fact that many composers use the computer regularly in their work. If the use of algorithmic techniques is to increase, as the author believes is inevitable, it is essential that bridging mechanisms are found. Systems based around or including programming interfaces to traditional notation are one such solution. But the programming aspect is important, as this gives the freedom and flexibility that stimulates innovation.

Also important is that notation is not the exclusive focus, as many forms of music do not involve the use of Western musical notation in their practice.

An open-source, specialised algorithmic composition programme written in the general programming language Common Lisp and its object-oriented extension, clos, *slippery chicken* has been in development since 2000. By specialised as opposed to generalised, it is meant that the software was originally tailor-made to encapsulate the author's personal composition techniques and to suit his own compositional needs and goals. As the software has developed however, many general-purpose algorithmic composition tools have been programmed that should be useful to a range of composers. The system does not produce music of any particular aesthetic strain; for example, although not programmed to generate tonal music the system is quite capable of producing it. Furthermore, the software's release as open-source, object-oriented Common Lisp code encourages further development and extensions on the part of the user.

The algorithmic system in *slippery chicken* has been used to create musical structure for pieces since its inception and for several years now has been at the stage where it can generate, in one pass, complete musical scores. It can also, with the same data used to generate those scores, write sound files using samples, or midi file realisations of the instrumental score. The project's main aim is to facilitate a melding of electronic and instrumental sound worlds, not just at the sonic but also at the structural level. Hence certain processes common in one medium (for instance sound file slicing and looping) are transferred to another (the slicing up of notated musical phrases and the instigation of sub-phrase loops, for example). Techniques for the innovative combination of rhythm and pitch data — arguably one of the most difficult aspects of making convincing musical algorithms — are also offered.

Perhaps the debate surrounding the relative merits of analogue versus digital studio technology have most convincingly shown that combinations of the old and the new offer the best solutions. This applies just as well to music composition and performance. Formats that continue to include rather than bypass the talented and highly-trained acoustic musicians which our musical infrastructure has produced yield the most impact, particularly when viewed, for better or for worse, from the audience's perspective. To this end, hybrid works combining digital and acoustic instrumental technologies are ideal. *slippery chicken* is focussed on exactly such musical bridging solutions: using the computer to combine and meld together electronic and acoustic resources at both the structural and formal level.

Michael Edwards
Edinburgh, July 17th 2012

track listing

altogether disproportionate | 26.40
piano and computer
Per Rundberg piano; Michael Edwards, vocals

who says this, saying it's me | 15.07
tenor sax and four-channel sound file
Gianpaolo Antongirolami saxophone

tramontana 14.09
viola and computer
Garth Knox viola

don't flinch |13.44
acoustic-electric guitar and computer
Yvonne Zehner guitar

for Magda Cordell, if she'll have it | 15.27
piano and computer
Rei Nakamura piano

dvd bonus track

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programme notes

altogether disproportionate
piano and computer 2010
first performance 15/11/2010, Edinburgh, uk:
Per Rundberg http://o.mk/a5930

"We are not a young people with an innocent record and a scanty inheritance. We have engrossed to ourselves — an altogether disproportionate share of wealth and traffic of the world. We have got all we want in territory, and our claim to be left in the unmolested enjoyment of vast and splendid possessions, mainly acquired by violence, largely maintained by force, often seems less reasonable to others than to us."
Winston Churchill 1914

It is simultaneously satisfying and disturbing to read that such a powerful man as Churchill clearly understood the nature and causes of the staggering disparity of wealth between his country and those whom it colonised. At the same time, it is to our shame that he and successive leaders did so little to redress injustices. In fact, writing only five years later about possible solutions to the Iraq problem of his time, Churchill would appear to be quite a different man: "I am strongly in favour of using poisoned gas against uncivilised tribes", he wrote in 1919.

Whilst writing this piece I was mindful of conversations Per Rundberg and I have had regarding works for piano and electronics. Per has pointed out that one of the difficulties of using amplification is that musicians perform not just in, but with the architectural space of a concert hall; that they learn to project their instrument's sound into that space; and that loudspeakers disturb this relationship. So although I nevertheless wanted to write for piano and computer, I decided to place the loudspeakers under the piano. This allows me to excite the piano's sound board with electronics; mix the instrumental and electronic sources acoustically, in situ, rather than electronically, in a mixing desk; and allows Per to perform without amplification, balancing sound levels according to both the acoustic properties of the piano and the hall he plays in.

who says this, saying it's me?
tenor saxophone and four channel sound file 2009
first performance 25/11/2009, Edinburgh, uk:
Marcus Weiss http://o.mk/56b2b

"Where would I go, if I could go, who would I be, if I could be, what would I say, if I had a voice, who says this, saying it's me?"
Samuel Beckett, opening of *Texts for Nothing 4*

Composers' concentration on the musical text and the general perception of composers as exclusive musical visionaries who set down notes which performers need only play in the right order and with the required precision in order to succeed, greatly obscures the role of the performer and all s/he brings to a piece of composed music. We can see this not just in terms of conscious interpretation, but centuries of mostly undocumented and implied performance practice; all the intricate details which need to be mastered to bring music to life, but which are not to be found on the page.

In my recent works I often treat the score not as an ideal which must be achieved but as a system to strive against. All the usual notational details are present and most are quite simple. There is nothing aleatoric or random about the score, but one or two of the performance parameters will be extreme. In this piece, the speed at which musical material is to be presented is such that the performer is forced to skim to improvise even, to react to the score rather than simply (!) play it. The intention is for an unusual energy and tension to arise, along with unimaginable and perhaps unnotatable sounds.

tramontana
viola and computer 2002 - 2004
first performance 12/8/2004, Darmstadt, Germany:
Barbara Maurer http://o.mk/44e53

tramontana was mostly written in 2002 in Bellagio, Italy, shortly before I moved to Edinburgh after a five-year stay in Austria. The title is from a Eugenio Montale poem that refers to a stark, cold, northerly wind coming from the mountains.

The piece has three sound sources: 1) the live, amplified viola, tuned so that the first three strings have a harmonic that is exactly in tune with the seventh partial of the fourth string; 2) 4-channel sound files made from samples of a recording of the viola part; and 3) live processing of the viola using Max/msp and a C programme I wrote for live granular synthesis with transposition. The version for first performance with the Experimentalstudio Freiburg included grains circulated around the audience in eight channels using the Halaphone hard/software.

don't flinch
acoustic-electric guitar and computer 2010 - 2011
first performance 8/7/2011, Millport, uk:
Yvonne Zehner http://o.mk/cccc8

The bottleneck guitar sound was utmost in my mind from the very beginning of working on this piece. I have a very strong and fond memory of watching Ry Cooder play the guitar with a bottleneck on the now defunct uk tv music show *The Old Grey Whistle Test* when I was about three or four years old.

This piece is out of the ordinary for music of this genre in having what is essentially a conventionally notatable computer part. I was attracted to the idea of creating an almost acoustic instrumental trio, but having the luxury of continuously modifying, refining, and spectrally shaping two of the voices through digital production techniques.

In addition to software samplers and synthesizers, several other sounds were mixed in: a recording of myself improvising on tenor saxophone; myself reciting *Don't flinch*; recordings of sheep; and Artaud's *Pour en finir avec le jugement de dieu*. The latter was used purely for its sonic and not its semantic content. The title is taken from the poem *Don't flinch* by Adrienne Rich.

for Magda Cordell, if she'll have it
piano and computer or piano solo 2007
first performance 19/11/2007, Huddersfield, uk:
Sarah Nicolls http://o.mk/948cd

Commissioned by Sarah Nicolls as part of her 2007 ahrc grant (R26109) 'Expanding the repertoire for piano and live electronics'. *for Magda Cordell, if she'll have it* was created with a looping technique originally designed for processing digital audio but now adapted to looping notated rhythms. Magda Cordell's *Figure (Woman)* is a hugely energetic painting that manages to create recognisable forms from techniques we usually associate with abstract expressionism. This is analogous to the conscious yet non-reactionary use of tonal (even jazz-like) structures in the cascade of notes that pour forth in my piece.

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biographies

Michael Edwards was born in Cheshire, England, in 1968. He studied composition at Bristol University with Adrian Beaumont and privately with Gwyn Pritchard. In 1991 he moved to the us for further studies in computer music with John Chowning at ccrma, Stanford University. During his time there he also worked at ircam, Paris, with a residency grant at Cité des Arts. In 1997 Michael moved to Salzburg, Austria, where he was Guest Professor for Music and the Internet at the Mozarteum until 2002. Michael now teaches at the University of Edinburgh. His music has been performed worldwide at festivals such as the Darmstadt Ferienkurse, the Huddersfield Festival, the International Computer Music Conference, the Zagreb Biennale, etc. and by musicians such as Klangforum Wien, Ensemble Aventure, Ensemble Intercontemporain, Marcus Weiss, Sarah Nicolls, and Garth Knox. Michael is also active as an improvisor on laptop, saxophones, and midi wind controller, performing at venues such as the Montreux Jazz Festival and releasing on Leo Records.

Per Rundberg was born in Skelleftea, Sweden. He studied at the Royal Academy of Music in Stockholm with Staffan Scheja and with Seta Tanyel at the Yehudi Menuhin School in England. He continued his studies at the Mozarteum in Salzburg with Karl-Heinz Kämmerling, graduating in 1995 with honours. Further studies at the École Normale de Musique Alfred Cortot, Paris; the Franz Liszt Akademie Budapest; in Rome; and with Murray Perahia. Rundberg frequently gives concerts all over Europe, in Asia and in the usa and has performed at major concert halls such as the Concertgebouw Amsterdam, Konzerthaus and Musikverein, Vienna, Konserthuset Stockholm, Tonhalle Zurich, Konzerthaus and Philharmonie Berlin, etc. As a soloist he has performed with the Mozarteum Orchestra Salzburg, the Swedish Radio Symphony Orchestra, Morávska Filharmonie, The Ostrobothnian Chamber Orchestra Finland and the Umea Symphony Orchestra. His chamber music partners include Martin Grubinger, Alfons Kontarsky, Benjamin Schmid, Valentin Radutiu and Jörg Widmann.

Rei Nakamura was born in Tokyo, and raised in Brazil, where she began piano studies and won numerous national competitions. She continued her studies in Germany at the Hochschule für Musik Freiburg, and postgraduate studies in contemporary music at the Hochschule des Saalandes, where she graduated with first-class honors. Nakamura was invited to the Nachwuchsforum of Ensemble Modern, won the Kranichsteiner Stipendiumpreis at the Ferienkurse für Neue Musik, Darmstadt, and is a regular performing guest in prominent festivals across Europe. Nakamura has devised a number of concept-driven projects, which have been presented across Europe and Asia, including "Movement to sound — sound to Movement", for piano, electronics, and video (2007). Currently in its fifth year, it continues to draw new composers, and performances have included the Festival for Contemporary Music Ecuador (Quito), zkm Festival Piano+ (Karlsruhe), and Art's Birthday Party (Sweden).

After receiving his Diploma in Saxophone with top marks, **Gianpaolo Antongirolami** went on to attend advanced courses with Jean-Marie Londeix and to obtain a Diploma in Electronic Music. He plays regularly as soloist and in various chamber music groups and orchestras. He works primarily in the context of contemporary music, and has performed world premieres of several compositions written especially for him. As an educator, Antongirolami holds the Chair for Saxophone at the Conservatory of Perugia and is regularly invited to give advanced courses, masterclasses and concerts at prestigious European musical institutes and venues. He has recently been invited by the international association SaxAmE (Saxophone in America and Europe) to be included in an upcoming book which will gather the biographies of the most important saxophonists of the last 20 years: Saxophone Soloists and Their Music, to be published by Indiana University Press.

Yvonne Zehner studied with Mathias Seidl, Eliot Fisk, and Joaquin Clerch at the Mozarteum, Salzburg; with Oscar Ghiglia at the Accademia Musicale Chigiana in Siena; and with Nicolas de Souza Barros in Rio de Janeiro. In October 2001 she graduated from the Mozarteum with distinction. Yvonne has taught guitar at the University of Passau since 2001. She has worked with Sofia Gubaidulina, Konstantia Gourzi, Benjamin Lang, Greg Caffrey, Siegfried Steinkogler, Klaus Ager, and Andor Losconzy on premieres of their works. In October 2010 she released her solo album Passages on the Neo-Loop label (Sony Music). Yvonne Zehner has performed at a variety of international festivals and concert series including the aspekte Festival of Contemporary Music in Salzburg, Summer in Stuttgart, The Passau European Festival, and Incontri Chitarristici di Gargnano. She has toured many solo and chamber music engagements in Europe and Brazil.

Garth Knox is one of the most sought after contemporary musicians of his generation. After studying at the Royal College of Music, London, he played with most of the leading groups in London in a mixture of all repertoires, from baroque to contemporary music. In 1983 he was invited by Pierre Boulez to become a member of the Ensemble InterContemporain in Paris, involving extensive solo and chamber music playing, touring widely, and appearing in international festivals. In 1990 Garth Knox joined the Arditti String Quartet, playing in all the major concert halls of the world, working closely with and giving first performances of pieces by leading composers such as Ligeti, Kurtag, Berio, Xenakis, Lachenmann, Cage, Feldman, and Stockhausen (the famous *Helicopter Quartet*). Garth Knox now lives in Paris, where he enjoys a full time solo career, giving recitals, concertos, and chamber music concerts all over Europe, the usa, and Japan.
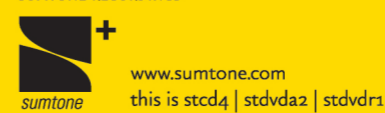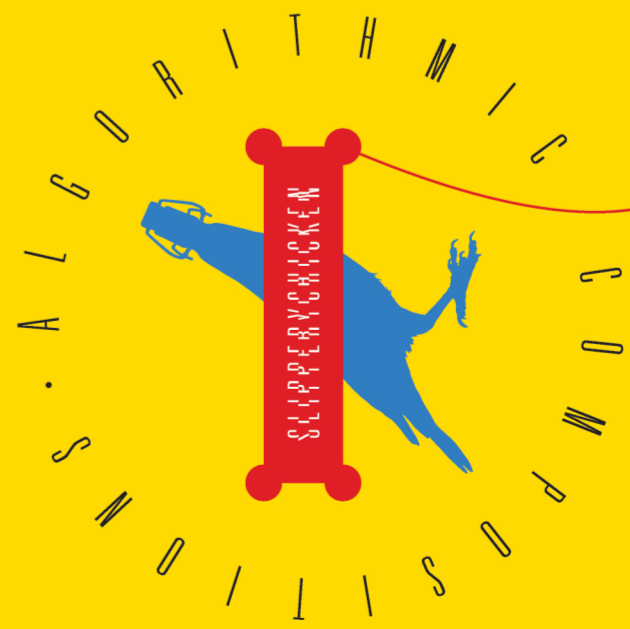
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