
Chroma

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Jen Muller, Georgina Bickell, Hannah Mercia and Sarah Charlwood from QUT's *Simulation*, perform "water::stone: :leaf::voice", as part of the monthly *Small Black Box* series held at the !Metro Arts Complex in Brisbane.

EDITORIAL

Welcome again to another Chroma, the last for 2001. This has been a pretty eventful year from both global and local perspectives, with the latest war (you people know what this is) affecting to some extent the recent Australian Federal Election. So now the Australian's among us are faced with another term of John Howard's government, and most probably more funding cuts to our academic institutions and arts organisations. Do we stick it out for another three years, and keep whinging about how we can't keep surviving under these conditions? From my experience with all of you fantastic educators and artists, the answer would have to be a big, fat NO – I know that you will keep educating, researching, and creating because you all love it, and you all believe that education and the constant creation of art are essential for our communities.

I find it great to see a new ad for a concert/installation/performance every time I check my email, and that there is something almost always on in every State is inspirational.

There are loads of conferences coming up over the next year, including Second Iteration (more information later in this issue), and next year's ACMA Conference – most likely to be held in Melbourne.

Over the year, the ACMA email list has grown from a gig postings list to almost becoming a (gasp!) *discussion* list, and has fast become an essential centralising factor for computer musicians/educators throughout New Zealand and Australia. A new web site for ACMA members is currently being worked on, which you will hear more about soon via *acma-l*. And there are plans to allow membership applications and payments to be completed via the web.

The ACMA committee is on the lookout to improve the services that ACMA can provide to its members – if you have any ideas for improvement or any criticisms, please don't hesitate to drop a line to one of the committee members, or to start a discussion on *acma-l*.

And finally, a big thank you goes out to all those people who have made contributions over the last year to Chroma, with particular thanks to Andrew Lyons, who was kind enough to provide us with a beautifully written obituary for Ian Fredericks, who passed away earlier this year.

Dan Horwood
Chroma Editor.

ACMA PRESIDENT'S REPORT

Happy holiday season to all Chroma ACMA members, and welcome to the final Chroma for 2001. This has been the first Chroma for some time and so there are a number of events that are worth commenting about.

The Waveform conference was ably run by Julian Knowles, and a big thank you from all ACMA members is due to him and his team. Our annual series of conferences is one of the major ways ACMA contributes to the computer music community and organising one is a large undertaking. Waveform was a fantastic forum for hearing about recent research, compositional activity, and hearing concerts from a wide variety of performers. The conference was particularly note worthy in bringing an audience not regularly at ACMA conferences. In particular there was a good international presence and strong representation from members of the electronica community. The venue at the University of Western Sydney provided an excellent range of spaces for all the activities including a large number of permanent sound installations. Finding the place and getting to and fro was a challenge for some but a great time was had by all.

We are hoping that the next conference will be held in Melbourne on July 12-14 2002 so keep a look out for more details in the next Chroma.

The ACMA web site continues to have good visitation rates, and there are plans to enhance the content by adding a members data base and links amongst other things. The site is well maintained by Ian Whalley, who was nominated for a position on the ICMA board but was unsuccessful in the elections. As part of the Oceania region of ICMA Australians and New Zealanders are quite outnumbered by our ICMA colleagues to the north in such elections, so I encourage all ACMA members to join the ICMA so we might have a chance at a stronger international voice in future.

The ACMA email list has been mentioned by Dan in his editorial with regard to some of the more vocal discussions. These seemed to have died down of late although it still has a steady traffic of concert announcements that is nice to see. Gordon Monro, Anthony Hood and Roger Dean from Sydney seem to be leading the concert organization race this year, so well done folk. There are no doubt plenty of other computer music activities

around our countries so don't forget to advertise on the list (calls for works would be great also).

Mikropolyphonie, the online journal, published an issue with many papers from Waveforms included. It has since then put out another issue and so is very active – check it out. Mikropolyphonie is not formally part of ACMA but its editor David Hirst was a past president of ACMA.

I hope you enjoy this issue of Chroma and please think about contributing a concert, CD or software review or any other article that you think will be of interest. The collating of Chroma is made a lot easier when there's a steady flow of material to publish.

See you in the new year,

Andrew R. Brown
ACMA President

2ND ITERATION CONFERENCE REPORT

Second Iteration: the second international conference on generative systems in the electronic arts was held at Monash university in Melbourne from Dec 5-7 2001. The conference is the followup to 1st Iteration two years prior and both were organized by Alan Dorin and Jon McCormack from Monash's Center for Electronic Media Art (CEMA). The theme of the conference was emergence with a focus art created with artificial life processes.

The conference was made more engaging because of an interesting mix of visual artists, musicians, architects, roboticists, media theorists, and computer scientists. The organizers did well to attract some very impressive international speakers. Erwin Driessens and Maria Verstappen showed a selection of their impressive visual art works that focused on emergent behavior. They included digital works based on cellular automata to a mechanical installation that created, documented and recycled wax shapes on a production line. Katherine Hayles, well known amongst digital media theorists, gave a presentation on a research partnership between the USA military and entertainment industry. She demonstrated how close the simulation technologies are between them and pointed out some of the clashes of culture that occurred when they worked together. Her presentation was both

thought provoking and somewhat alarming. Christa Sommerer presented some of the visual design work by her and Laurent Migionneau. This ranged from interactive systems to mobile phone games. Each having a strong influence on emergence, often using artificial plants and animals. Her work is well regarded and as a collection quite impressive.

There were three days of paper sessions and demonstrations with a good number of music-related sessions that I will now summarise.

Rodney Berry, an Australian now working in Japan, who showed his artificial life work which combined effective 3D graphics, programmed by Alan Dorin, and a generative music algorithm.

David Birchfield, from the USA, showed an impressive real time performance system where the computer parts were algorithmically generated using iterative processes. He showed a performance for computer and live percussionist where he performed with the system reading the 'score' as it was generated by the software.

Garth Paine talked about the development of his interactive installations. Including Gestations that was recently opened at RMIT gallery in Melbourne. Garth focused on the way his works grow and evolve their material based on audience interaction.

Andrew Brown presented his research into the effectiveness of genetic algorithms to create extensions from melodic fragments. His work compared classic stochastic processes with rule-based mutations and showed that the most difficult job was to adequately describe a 'good' melody.

Ananda Poernomo talked about composition software written by him and his brother Iman, which assist in set theoretic composition processes. The software is called Mosaic and takes the form of a library of function in the Haskell language. All you serialists out there take note!

Tatsuo Unemi presented the SBEAT software written by him and Manabu Sends. This impressively complete software creates a one bar phrase and breeds eight variations on it. These can be played one after the other in real time (via MIDI) to produce an slowly changing musical passage. The process is quite extensive and sounds great for endless computer game ditties.

The conference ran smoothly and had a casual but serious feel to it. The variety of people made it a really interesting conference. Let's have more Alan and Jon.

Andrew Brown
Queensland University of Technology

**pnlcrn - SIMULATION.
21 OCTOBER 2001
METRO ARTS, BRISBANE**

Richard Wilding

Simulation was the culmination of a semester's work in electronic music performance by students of the Queensland University's Faculty of Creative industries. Rather than presenting the performance in a university environment the programme's artistic director, Greg Jenkins, decided to shift it to the more public venue of the Metro Arts building as part of the ongoing Small Black Box series of sound art and experimental music coordinated by sound artist, Andrew Kettle. The night consisted of four group compositions, with emphasis on collaboration and live interaction between performers using a variety of electroacoustic tools and techniques.

ElectroQUTE:

i water::stone::leaf::voice

Consisting of Jen Muller, Georgina Bickell, Hannah Mercia and Sarah Charlwood, ElectroQUTE explored a hybrid landscape of live electronically manipulated acoustic events drawing on the organic elements of the work's title accompanied by electroacoustic compositions on CD. The performance was evocatively (and sometimes provocatively) choreographed with performers dressed in rather outrageous nurses uniforms moving around the physical space and using a variety of sound-producing props – a mixture of musique concrete and burlesque. At times the work approached Zen-like beauty with such simple elements as throwing small stones into a contact mic'ed wooden bowl or the susurrant of leaves on carpet creating sonic meditations on the nature of duration and timbre.

LED: *noise::melodies::cybernetic manipulations*

Once again a hybrid work, LED members, Drew Carter (guitars), Dale Hembrow (Max/MSP, mixage), Tarin Stewart (synthesisers), Benn Woods (Max/MSP, controller construction) and Carly Tennant (vocals), chose a post-modern approach by essentially deconstructing the melodic pop idiom. At the heart of the piece were melodic vocal and guitar lines that refused to settle into song form but instead were fragmented and distributed across stylistic and generic boundaries. This process was catalysed with the use of Max/MSP software interfacing with custom-built, Dataglove-style gestural controllers.

noit a'lumis:

slipping::breaking::stretching::tearing

Yanto Browning (mixage), Matt Weimers (sonic construction), Gerard del Favero (auto-harp) and Amelia Dowe (piano accordion) presented a work that was ostensibly a protest against the United Nations' decision to ban the piano accordion as a violation of the Geneva Convention (!). The wall of sound which ensued perhaps was more a demonstration of the accordion's prospective abilities in the genre of heavy metal. Joking aside, this was a highly complex work of noise and harmonic elements variously manipulated, granulated and distorted and made good use of the quadraphonic PA system.

Cycas Media: *Out of Cage*

An ambient backdrop was provided during breaks in the performances by Lorraine Lie, Aaron Nebauer and Chris Wilson using various shortwave and fm radios. One of the best aspects of radio works like this is the component of aleatory – composers and performers have no idea what elements they will have to work with. Some of the found objects Cycas Media tuned into were absolute gems and the end result at times was haunting and humorous. My only reservation was the usual one with respect to ambient background works: so much of it might have rewarded close listening but the audience was generally too unfocused to be aware of its subtleties.

All the pieces showed the benefit of careful gestation without appearing overworked and there was an energy and freshness that is often missing from electroacoustic performances. At times I was able to discern some unique approaches to compositional method and hopefully the students will use this success as a starting point for future development of their own individual voices.

**NEW COMMITTEE MEMBERS
ELECTED AT 2001 AGM**

All of the office-bearers listed were elected unopposed.

Executive Officers

President: Andrew Brown.
Vice-President: Lisa Meridan-Skipp.
Secretary: Peter Mcilwain.
Treasurer: Anthony Hood.

Non-executive officers

Publications officer: Dan Harwood
Web officer: Ian Whalley.
Membership officer: Peter Mcilwain.
Public officer: Ross Bencina
Promotions officer: Adrian van den Dries.

OBITUARY
IAN FREDERICKS

Andrew D Lyons <tstex@tstex.com>

At Ian Frederick's funeral I found myself to be upset to a degree that surprised me given the short period of time for which I had known him. I was more upset on that day than I have been at the funerals of others to whom I have been more closely related, and afterwards I devoted some thought to understanding what it was about Ian that made this the case.

At first I thought it might have been the admirably masterful manner with which Ian was able to subjugate science and mathematics to the realisation of his transcendent sonic visions. It had also impressed me greatly that a long wrestle with the soul destroying impositions of both primitive computer technology and academic politics hadn't diminished or diverted his transcendent creative focus. In the end however I realised that I could only fully understand the sense of loss I felt by visualising Ian from memory, and observing the white light that he radiated from within. The sense of loss I felt with Ian's passing was not for myself personally, nor for the electro-acoustic music community, but due to his absence within our larger human collective.

Whilst alive, Ian Fredericks was like a white giant star delivering fire from the heavens. With his return to these heavens he has left our world somewhat impoverished in terms of this kind of illumination. Still, the fire that he has fuelled in some amongst us is a reason for hope in these dark days of reflected light, arbitrary orbits and outright black holes. While the passing of stars like Ian never goes without mourning amongst people that look skyward from time to time, I'm pretty sure I can see some new lights forming within the beautiful nebulae he left behind.

ORGANISED SOUND
AN INTERNATIONAL JOURNAL OF MUSIC
AND TECHNOLOGY
CALL FOR ARTICLES AND WORKS

<http://uk.cambridge.org/journals/oso/>

Volume 7, Number 2

Issue thematic title: *Mapping Strategies in
real-time computer music*

Date of Publication: August 2002

Publishers: Cambridge University Press

Guest Editor: Marcelo M. Wanderley, McGill
University, Montreal, Canada.

Mapping Strategies in real-time computer
music:

Traditionally the main focus in gesturally-controlled real-time interactive computer music has been on either the design of novel input devices (gestural controllers) or on new synthesis algorithms, where one-to-one mappings between gestural variables and synthesis variables were the rule. Nowadays, there is a trend to broaden the focus to include considerations on the role of different mapping strategies, their definition and their influence on design.

In this issue of Organised Sound, our goal is to analyse in detail the various approaches to the definition of mapping strategies in both the design of new digital musical instruments and as part of interactive music systems.

Questions to be addressed include:

- Is mapping part of a composition, part of an instrument, or both?
- How can one devise mapping strategies for these different systems?
- Are there models of mapping strategies available?
- Should mapping be explicitly defined or devised using methods such as neural networks? Should it be static or dynamic? Simple or complex?
- What is the influence of the choice of mapping strategies in the expressive capabilities of new instruments? Is it simply an aesthetic choice?

We invite original contributions on the role of mapping and on the design of mapping strategies in both new instruments and interactive systems, including the review of existing works where the definition of mapping is intrinsically analysed.

Deadline for submissions is February 1, 2002. Audio and/or audio-visual material will be presented as part of our annual CD which will appear with issue 7/3.

The editors, as always, welcome submissions that fall outside of the scope of this issue's theme.

Notes for Contributors/further details can be obtained from the inside back cover of published issues of Organised Sound or from:

<http://uk.cambridge.org/journals/oso/>

THE AUSTRALIAN SOUND DESIGN PROJECT

Designing public acoustic space: Australian sound designs, a database and web site towards a more considered acoustic environment.

Keywords

Sound: Design: Acoustic Space: Public: Australian

Aims

1. Nation-wide database and web site of Australian sound designs
2. Define the Field of Australian sound design, identifying private and public spaces.
3. Provide models of successful sound designs.
4. Show the variety of methodologies used by designers.
5. Provide a bibliography of related research materials.
6. Open debate on how public and private space affects sound design.
7. Raise the consciousness of the importance of Australian sound design by establishing a presence nationally and internationally.

Description

Sound design is a new interdisciplinary field in which Australia has made pioneering contributions, but to date, little has been documented. The project Australian Sound Design of Public Acoustic Space is a research project hosted by the Australian Centre at the University of Melbourne and funded by a large grant from the Australian Research Council to enable the development of a nation-wide data base and website of Australian Sound Design.

A representative sample of Australian sound designs, from both indoor and outdoor sites will help to communicate this national practice. An emphasis on public space will focus attention on place, raising issues of land ownership, noise pollution and soundscape. This will help to clarify who is designing public acoustic space and where public and private acoustic concerns interface.

The comprehensive database and cross-referenced web site will provide a platform for further discourse and analytical study. Historical and stylistic trends can then be observed. The language and practice of sound design will be developed through ensuing discourse and the importance of sound profiled for interdisciplinary designers, curators, musicologists, acousticians, communications engineers, architects, urban and regional planners, environmentalists, sound artists and musicians.

This is an invitation to be part of a new nationwide network of sound design, fostering its practice, implementation and critique.

Invitation to be part of the Australian Sound Design Project.

Wednesday, 1 August 2001

Dear Sound Designer/Artist/Curator

You are invited to participate in the Australian Sound Design Project. The Project statement is attached. The nation-wide database and web site will network this important field in Australia for the first time and provide a detailed repertoire of sound designs from a variety of venues and locations. By creating a centralised database, this project, will facilitate a more detailed study of the relationship between acoustic space and sound design practice in Australia.

Each contributor is being asked to provide the details in a form and return it to the address below, attention Australian Sound Design Project, Dr Ros Bandt. Diagrams, photographs, concept designs, technical drawings and statements of most works are desirable. Two representative examples of works to be treated in more depth are requested. Video or sound files of these works should be supplied in the listed formats. A RTF document is available from <http://www.sounddesign.unimelb.edu.au>. It would be most helpful if you respond within that form and email the completed document to gcpaine@unimelb.edu.au or r.bandt@unimelb.edu.au

There are over 150 key practitioners who have designed sound in public space throughout Australia. It is an exciting moment in time in the history of the field and your contribution will be an important part of its success.

Please sign and return the copyright release for the support material to enable your material to be published on the website. You will be able to update your material by emailing the project with changes. Suggestions for other sound designers you feel should be included in this project would be gratefully received. Please feel free to contact us with any questions or suggestions.

Contact:

gcpaine@unimelb.edu.au Garth Paine
r.bandt@unimelb.edu.au Ros Bandt
<http://www.sounddesign.unimelb.edu.au>

MIKROPOLYPHONIE UPDATES

David Hirst

<http://farben.latrobe.edu.au/mikropol/>

Mikropolyphonie, the online contemporary music journal, has just published the following articles:

Gordon Monro

Some Sound Modifications Using Wavelets

http://farben.latrobe.edu.au/mikropol/volume5/monro_g/acma99_mikro.html

Simon Dixon

On the Computer Recognition of Solo Piano Music

http://farben.latrobe.edu.au/mikropol/volume6/dixon_s/mikro.html

Watch out for the up-coming Brazilian Music feature!

Recent Mikropolyphonie editions:

MikroPolyphonie 6 : ACOM 2000

Editors:

David Hirst, University of Melbourne,
d.hirst@unimelb.edu.au

Dr Gordon Monro, University of Sydney,
gmonro@mail.usyd.edu.au

Articles:

Andrew Brown

Modes of Compositional Engagement

Alan Dorin

Boolean Networks for the Generation of Rhythmic Structure

Greg Schiemer

Boolean logic as a harmonic filter

Steve Dillon

Making computer music meaningful in schools

Ian Kaminskyj

Multi-feature Musical Instrument Classifier

Ian Stevenson

Diffusion: Realisation, Analysis and Evaluation

Forum:

Roger Alsop

Teaching Electro-Acoustic Composition to the Uninitiated

Warren Burt

Brisbane Nocturn - An Algorithmic Composition Using Softstep

CONCERT REVIEW

2ND ITERATIONS

Gordon Monro

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I attended this conference, and here are some comments, with a focus on music-related presentations. Usual disclaimer: this is a personal view of a complex event.

The conference, described as the "second international conference on generative systems in the electronic arts", was held at the Caulfield campus of Monash University, Melbourne, on 5th – 7th December 2001. The conference was ably organised by Alan Dorin. He was assisted by Jon McCormack and Troy Innocent, but the main burden fell on Alan, so there were no exhibitions or performances, just the conference itself. However, for me it was very interesting and worthwhile.

At most sessions there were around 50 people; since some could only stay for part of the conference, there were about 80 participants in total. About a dozen of these were from overseas; they made a very significant contribution, so the label "international" was justified.

The presentations covered a wide area: animation, music, architecture, robotics, biology, and theoretical issues.

Generative systems and generated art

"Generated art" involves some process which is created or set up by the artist but then proceeds to operate more or less independently of its creator. Furthermore, the actual process is an important part of the artwork. This conference had a sub-theme "emergence", which is discussed below.

The commonest technique used in the conference was that of "genetic algorithms" (GAs for short) or "simulated evolution". Suppose we want a system to generate musical phrases. We treat each musical phrase as an organism, which has "genetic material" (just a string of numbers) and a "body" which is the actual musical phrase. We select two phrases as "parents" and breed them to produce "children" (whose genetic material is a mixture of that of their parents). We can also have "mutation", by making random changes in the genetic material. We need a process to convert genetic material into "bodies" (musical phrases), and then we subject the resulting phrases to selective pressure: we need a "fitness function" which determines how good the musical phrases

are. We keep the best phrases, breed from them, and so on.

In scientific and engineering problems, there is often a fairly clear idea of what a good solution is, so the fitness function can be straightforward. In an artistic context we may want to create "interesting" musical phrases, without any idea of how to measure interestingness. One solution is to make an interactive system. The user selects the most "interesting" musical phrases of each generation and allows them to breed, while the rest are discarded. If we want a fully automated process, it seems that getting a good fitness function is the hardest part.

Apart from genetic algorithms, it seemed that half the people at the conference had had a go at simulating ant swarms.

Musical presentations

There were three presentations on breeding music. Tatsuo Unemi (Japan) presented work on composing short jazz pieces (for medium-sized band), Andrew Brown (Brisbane) described work on breeding continuations of melodies from a short initial seed, and David Birchfield (USA) described and demonstrated an elaborate real-time composition system.

Tatsuo Unemi's system had a recursive patterning process built-in, so it produced successful results within a limited range of variation. Andrew Brown's process was more open-ended and less immediately successful. His fitness function was a weighted average of various characteristics, including note density, rhythmic variety and repetitions of pitch patterns. Random initial melodies did evolve to something more coherent. However, Andrew also had a process for generating reasonably structured melodies. If these were used as the initial population, the genetic algorithm was unable to improve them. Rob Saunders (of whom more below) suggested that instead of just one fitness function (Andrew's weighted average), it might be better to use several functions, and keep melodies with a high score in one or more functions.

David Birchfield's system used the interesting idea of genetic information at several levels. Each note had its own genetic material for pitch, duration and timbre, but in addition each phrase had independent extra genetic material controlling the phrase as a whole, and then there was still further genetic material controlling a section (group of phrases), and so on for about two more levels. David played a video of himself performing (as percussionist) live with the system as it evolved from an initial random state to a coherent structure of block chords.

An audio-visual work involving genetic algorithms was Rodney Berry's (Japan) "Listening Sky". Alan Dorin also worked on this piece, in which objects, represented by pointillist swirls of dots, move and breed on the surface of a sphere. Each produces a melody, which affects attractiveness for mating purposes, though the colour of the object is also involved in some way. Rod was eventually able to demonstrate the work running on two laptops (one for the visuals and one for the sound).

There were two other presentations concerned with sound and music which did not involve genetic algorithms. Garth Paine (Melbourne) described several of his interactive installations, which in general produce sounds which in some way respond to the movement of people in the installation. His latest work "Gestation" involves realtime generation of graphics as well, utilising ultrasound images of his friends' unborn children. Ananda Poernomo (Melbourne) described a system intended to assist composers who work with so-called set-theoretic composition. This is strongly associated with 12-tone serialist composition, and takes sets of pitch-classes as a fundamental concept. The software presented by Ananda can carry out transposition, inversion and so on, and can apparently help with the organisation of large-scale structures.

In the open session at the end of the conference there were two short music-related presentations. Jonathan Crane (Sydney) talked about some experiments in breeding timbres, using FM and additive synthesis; I talked about my piece "Peer Pressure", which is an aural representation of a process which causes fireflies to flash in synchrony. Additionally the only actual performance not in a presentation was music generated by Andrew Garton (Toy Satellite). I have to plead guilty to treating this as muzak; I was too busy talking with other conference participants and getting into the grog that Alan Dorin provided. So I can't report on what Andrew's system was doing.

Other presentations

Of course, music was only one of the topics of the conference. Here are summaries of some of the other presentations.

The opening presentation was by Katherine Hayles (USA). Katherine was well-known to a number of conference participants through her book "How We Became Posthuman". Her base is in literary theory and criticism, and she is concerned with the relationships between literature, new media, science and technology.

In her presentation she described and commented on an alliance between the U.S. military, the entertainment industry and academic computer scientists to construct elaborate simulations for the military. The one Katherine described was set in a Bosnian village, where a riot is developing near a military armoury, but also a soldier has been involved in a car accident in which a child has been injured; additionally a news cameraman is present. The participant has to decide on priorities and allocate forces. The simulation had computer game elements combined with sophisticated voice recognition software and motion tracking. It raises questions about ideological biases and portrayal of a foreign culture as well as questions about the reactions of the participants: did they become immersed, or did they treat it as just another artificial test? (There was certainly a "correct answer".) Also, a staggering amount of money was spent.

Maria Verstappen and Erwin Driessens (Netherlands) presented an impressive body of work which encompassed both screen-based works such as their "IMA traveller", a constantly changing cellular automaton landscape, and construction of actual physical objects. "The Factory" was an automated installation. In it, a dipper scooped up a quantity of molten wax from a heated container and dropped it into a bath of water. The wax formed an irregular blob of interesting (and often suggestive) shape, which was transferred to a conveyer belt and passed in front of a video camera, which recorded the blob. It was then returned to the wax container and melted down. Then another blob was created, and so on. Each blob stayed in existence for about 6 minutes, the only permanent record being the videotape.

Christa Sommerer (Japan) also presented a body of work, mostly done in collaboration with Laurent Mignoneau. Some of it concerned a system where Japanese mobile phone users could have little "artificial life" creatures downloaded to their phones. The phone owners could then nurture these creatures, tamagochi style, and even breed them with other phone-owners' creatures. There is also an option to get the phone number of the other creature's "owner"... . The most engaging piece that Christa presented was "A-Volve", a sort of virtual aquarium. Visitors to the installation could draw a profile and a cross-section; the software would then create a 3D creature. The creatures were projected from below into a tank of water, so they appeared to be swimming in the tank. The creatures could prey on each other, and also mate. In addition, there was a camera above the tank,

so by putting one's hand in the water one could, for example, immobilise a predator and allow one's own creature to get away.

These talks illustrate what became two sub-themes of the conference. Some artists seem to have become frustrated with screen-based works and want to make real objects, though Maria and Erwin appear to move happily between exploring impossible worlds on screen and working with real artefacts. The other sub-theme concerns the nature and extent of interaction with an installation. The works of Maria and Erwin generally have little or no user input, whereas Christa's depend heavily on user interaction, as do the works of Garth Paine, John Tonkin and other conference participants.

Maria made an interesting comment: some visitors to her studio who at first did not know that some of the graphic images were produced by a computer program expressed relief when they found out: they did not have to guess the artist's "meaning"!

Stuart Bunt (Perth) described the "SymbioticA" project, which uses tissue culture techniques for artistic purposes. This year the group exhibited at Ars Electronica (Linz, Austria). The installation, entitled "Fish and Chips", consisted of some fish neurons (part of a goldfish brain); the electrical activity of the neurons drove two robot arms which in turn drew on sheets of paper. There was also a sound output. The neurons apparently produced patterned white noise, and the drawings were mostly crosshatched lines. Stuart said that the team originally intended to have a real fish and chips shop there so that visitors could eat fish and chips while watching the installation. This was vetoed, ostensibly on health and safety grounds, but in fact because the organisers were trying to improve relations with the conservative citizens of Linz (whom they had thoroughly offended the previous year), and it was felt that eating fish while watching fish neurons performing would be too confronting.

Rob Saunders (Sydney/U.K.) presented his work on "curious agents". Each agent (a small part of a computer program) produced "artworks" and made them available to other agents. (The artworks were in fact images produced by genetic algorithms.) An agent would take an artwork from another agent according to a criterion of "creativity", which Rob took as "appropriately novel": novel, in that the artwork differed from the agent's current production, but appropriately novel, i.e. not too different. Agents with similar tolerance for novelty tended to form cliques; sometimes Rob also observed fashion cycles.

This work provoked considerable discussion, and also, I felt, some misunderstanding. By the way, Rob's model of a closed society of artists consuming each others' work appears to correspond pretty well to the situation of modern music in Sydney. According to a survey carried out some years ago by Fiona Allan, about half of the people attending modern music concerts regularly are themselves active producers, either performers or composers (and presumably most of the rest are spouses and girl/boyfriends).

Jon McCormack and Alan Dorin (Melbourne) presented a paper discussing the somewhat slippery notion "emergence", and there was some discussion during the conference. In the context of generative systems, it appears that "emergence" refers to: behaviour that is not "built-in"; behaviour when the system exceeds expectations; behaviour when the system surprises its creators. In discussion there was reference to some experiments about using genetic algorithms to configure arrays of electronic components to perform various tasks. In one case, it turned out that the resulting circuit was in part acting as a radio receiver and was collecting and making use of radio waves emitted by a computer in the same room. This is surely emergent behaviour!

There were plenty of other fascinating things at the conference. In general the presentations were of a high standard and the atmosphere was of friendly and constructive discussion, though I think there were some ideological fault lines lurking beneath the surface. A couple of the overseas people commented that there appears to be a relatively high concentration of algorithmic or generative artists in Australia. I don't know if this is true, or an illusion created by Alan Dorin's skilful organisation of the conference. In any case, Alan is to be congratulated.

ORGANISED SOUND
AN INTERNATIONAL JOURNAL OF MUSIC
AND TECHNOLOGY

Issue 5/1
Computer Music in Australasia and South
East Asia
Co-ordinated by Ian Whalley

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A view of computer music from New Zealand:
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William Dart, John Elmsly, Ian Whalley.

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