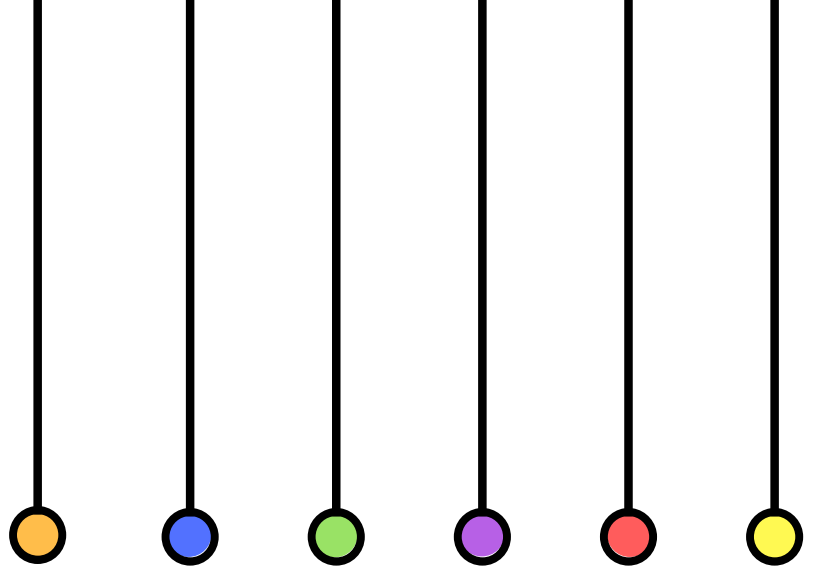




TENOR 2019

INTERNATIONAL CONFERENCE ON
TECHNOLOGIES FOR MUSIC NOTATION
& REPRESENTATION

ACMC 2019

AUSTRALASIAN COMPUTER MUSIC
CONFERENCE

PROGRAM

JULY 23-27

MONASH.EDU/TENOR2019
SIR ZELMAN COWEN SCHOOL OF MUSIC
MONASH UNIVERSITY



MONASH
University

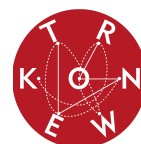


ROLI

MONASH
ARTS

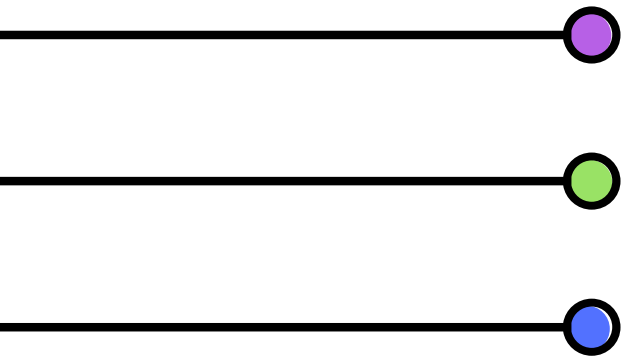
a c m a
Australasian Computer Music Association

DORICO



THANK YOU

Cat Hope, Conference Convenor
Lindsay Vickery, ACMC Coordinator
Nat Grant, Conference Manager
Jess Town, Project Manager
Ryan Ross Smith, Music Director
Aaron Wyatt, Workshop and Lab Coordinator
Karl Willebrant, Technical Manager
Chris Cody, Technical Coordinator
Sam Galyer, Technical Assistant
V Tzanis, event and administrative support
Megan Burslem, program production



You can follow the Sir Zelman Cowen School of Music
on Facebook, Instagram, Twitter, Vimeo and SoundCloud or by searching
the hashtag #MusicAtMonash

The notation graphics seen throughout this program booklet are courtesy
of Dr. Ryan Ross Smith.

WELCOME

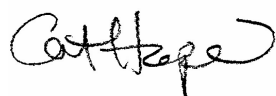
Dear TENOR and ACMC Delegates,

It gives me great pleasure to welcome you to Melbourne, and to the Sir Zelman Cowen School of Music at Monash University for these two conferences. We are glad to be the first institution in the southern hemisphere to present TENOR, a young but important and innovative conference addressing key issues around the design, representation and technology of music notation. I hope that running this conference alongside the ACMC will provide an opportunity to share knowledge and similarities in the way we engage with music, computing, representations and performance. I hope that the range of workshops, performances, performance laboratories, field trips and social occasions will enable a range of opportunities to think about and engage with contemporary music making.

Digital innovation is important to Monash University, and to the school of music. The school's Music Notation and Electronic Music research groups are active participants in performing and writing about music that involves experimental notations and approaches to performance, and takes part in a research culture that includes Masters and PhD students alongside staff, interested undergraduates and industry partners. Conferences are such a wonderful opportunity to engage in discussion, knowledge sharing and networking, and I hope you find plenty of opportunities to take part in such meetings of minds during TENOR and ACMC at Monash.

I hope you enjoy this conference and the beautiful surrounds of the Clayton campus of Monash University. This is the first conference to be held in part at the Ian Potter Centre for Performing Arts, that was only recently opened to the public. I would also like to take this opportunity to acknowledge that this conference takes place on the lands of the people of the Kulin Nation, and pay my respects to their elders past, present and emerging. The contributions of Indigenous peoples to the arts in this country continue to be significant, and I hope visitors have the opportunity to engage with this whilst in Australia.

I look forward to meeting you all throughout the conference,
Yours sincerely



Professor Cat Hope
Convenor.

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VENUES

ON CAMPUS

The Music Auditorium, Foyer, Drama Theatre, Drama Workshop, Computer Lab, and rooms G01 and 226 are in the Sir Zelman Cowen School of Music:

Building 68, 55 Scenic Boulevard
Monash University, Clayton Campus

The Sound Gallery and Jazz Club are in the Ian Potter Centre for Performing Arts:

48 Exhibition Walk
Monash University, Clayton Campus

OFF CAMPUS

Bar Open is at 317 Brunswick St Fitzroy, 3065

Melbourne Electronic Sound Studio (MESS) is located at 15 Dowling Place, North Melbourne, 3051

Grainger Museum is located at the University of Melbourne 13 Royal Parade, Parkville, 3052

Notting Hill Hotel is located at 260-262 Ferntree Gully Road, Notting Hill, 3168

CATERING

Morning and afternoon tea will be provided most days, lunch at delegates own expense. See the guide at the end of the program booklet.

TUES. 23 JULY

09:00-10:00 | FOYER

Conference registration and morning tea

10:00-12:00 | MUSIC AUDITORIUM

TENOR Panel 1: Singing from Country: Exploring Indigenous Australian Perspectives on Connections to Country through Music

12:00-13:00 | *Lunch break*

13:00-16:30 | MELBOURNE CITY

Grainger Museum, MESS visit

13:00-15:00 | AUDITORIUM

TENOR Performer's Lab: Robyn Schulkowsky

| G01

TENOR Workshop 1: Skot McDonald. Roli

| COMPUTER LAB

TENOR Workshop 2: Aaron Wyatt. Decibel Score Player

15:00-17:00 | G01

TENOR Workshop 3: Dorico Notation Software

| 226

TENOR Workshop 4: Shane McKenna. DabbleDooMusic

17:00-18:00 | IAN POTTER CENTRE FOR PERFORMING ARTS

Welcome to Country and Opening Cocktail events

18:30-20:00 | AUDITORIUM

TENOR Concert 1: Clocked Out Duo

20:00-20:30 | *Travel to Fitzroy, Melbourne City*

20:30-22:30 | BAR OPEN, FITZROY

ACMC Concert 1: Make it Up Club. Entry free for conference delegates

WED. 24 JULY

09:00 - 10:00 | FOYER

Conference registration open

10:00 - 12:00 | DRAMA WORKSHOP

ACMC Installation 1: Jack Woodbury

11:00 - 11:30 | *Morning tea* | FOYER

11:25 - 11:30 | AUDITORIUM

Opening remarks: Professor Cat Hope

11:30 - 13:00 | AUDITORIUM

TENOR Paper Session 1

| G01

ACMC Paper Session 1: Interaction and Generative Composition

13:00 - 14:00 | AUDITORIUM

TENOR Keynote 1: Miki Kaneda

14:00 - 15:30 | AUDITORIUM

TENOR Paper Session 2

| G01

ACMC Paper Session 2a Electronic Music Performance

| 213

ACMC Paper Session 2b Digital Tools

14:00 - 16:00 | DRAMA WORKSHOP

ACMC Installation 2: Leah Blankendaal

15:30 - 16:00 | *Afternoon tea* | FOYER

16:00 - 18:00 | AUDITORIUM

TENOR Panel 2: TENOR Network

18:00 - 19:30 | LOUIS MATHESON LIBRARY

Music Notation Exhibition Opening Event and/or dinner break

19:30 - 21:00 | SOUND GALLERY

TENOR Concert 2: Elision Ensemble

THUR. 25 JULY

09:00-09:30 | FOYER

Conference registration open

09:00-11:00 | SOUND GALLERY

Meyer Constellation Session

09:30-11:00 | AUDITORIUM

TENOR Paper Session 3

| G01

ACMC Paper Session 3a Compositional Approaches

| 213

ACMC Paper Session 3b Spatial Music

11:00-11:30 | *Morning tea* | FOYER

11:30-12:30 | AUDITORIUM

Keynote 2: Dr. Catherine Schieve

12:30-13:30 | *Lunch break*

13:30-15:00 | AUDITORIUM

TENOR Paper Session 4

| G01

ACMC Paper Session 4a Education Issues

| 213

ACMC Paper Session 4b Historical Perspectives

15:00-15:30 | *Afternoon tea* | FOYER

15:30-16:00 | AUDITORIUM

TENOR Concert 3: Monash Electronic Music Ensemble

16:00-17:30 | DRAMA THEATRE

ACMC Concert 2: Live electronics

17:30-19:00 | AUDITORIUM

TENOR Concert 4: Decibel New Music

19:30-22:00 | *Conference Dinner* | Notting Hill Hotel

FRIDAY 26 JULY

09:00-09:30 | FOYER

Conference registration open

09:30-11:00 | AUDITORIUM

TENOR Panel 3: Animated Notation Today

| G01

ACMC Paper Session 5

11:00-11:30 | *Morning tea* | FOYER

11:30-13:00 | DRAMA THEATRE

ACMC Concert 3: 8.1

13:00-14:00 | *Lunch break*

14:00-15:00 | AUDITORIUM

TENOR 2020 Announcement and Presentation

15:00-16:00 | AUDITORIUM

ACMC AGM

16:00-16:30 | *Afternoon tea* | FOYER

16:30-17:30 | 4TH FLOOR, MENZIES BUILDING

Tour of Music Archive of Monash University (MAMU)

17:30-18:30 | *Informal drinks* | JAZZ CLUB

18:30-20:00 | SOUND GALLERY

TENOR Concert 5: Speak Percussion

20:00-20:45 | DRAMA THEATRE

ACMC Concert 5: Instruments and electronics

SAT. 27 JULY

11:00-11:30 | FOYER

Conference registration open

11:00-13:00 | DRAMA THEATRE

ACMC Installation 3: Vicki Hallett

12:00-13:00 | AUDITORIUM

ACMC Concert 4: Video

13:00-13:30 | *Lunch break*

13:30-14:00 | AUDITORIUM

TENOR Performance

16:00 | *Post conference drinks* | NOTTING HILL
HOTEL



TUES. 23 JULY

10:00-12:00

TENOR PANEL 1

MUSIC AUDITORIUM, BUILDING 68

Aaron Corn, Grayson Rotumah, Jessie Lloyd and Aaron Wyatt

Singing from Country: Exploring Indigenous Australian Perspectives on
Connections to Country through Music

In many Indigenous Australian song traditions, country itself—the lands, the waters, and their living ecologies—is understood to be the archetypal plan from which all human expressions emanate. Many of these song traditions record how the homelands of Indigenous peoples were shaped, named and populated by their original ancestors, who chronicled detailed ancestral observations of their natural features. Such songs provide Indigenous communities today with a strong sense of connectedness to their countries and ancestors, as well as conceptual templates for how to read country and thrive in balance with its living ecologies. This panel will explore Indigenous Australian perspectives on connections to country through music across a continuum of traditional and contemporary genres. It will demonstrate how connectedness to country and ancestors continues to be a driving source of inspiration for musical expression and creativity among Indigenous Australians, and informs contemporary compositional approaches in a diversity of ways.

12:00-16:00

**FIELD TRIP: GRAINGER MUSEUM + MESS
MELBOURNE CBD**



Led by: Ryan Ross Smith

The Grainger Museum—the only purpose-built autobiographical museum in Australia—is home to a wonderful collection of art, photographs, costumes, music scores and instruments acquired by Percy Grainger, an icon of twentieth century Australian musical culture. The Grainger Museum staff offer guided tours which run for approximately 45 minutes. The Introduction to the Melbourne Electronic Sound Studios [MESS] Presentation includes a tour and talk by one of the Directors of MESS. For those visitors who are interested in booking some time on one of the many rare and one-of-a-kind machines available at MESS during their time in Melbourne, this is great opportunity to get an overview of what is available.

You must register for these Field trips, and you will need to make your own way to the museum for this visit. A taxi will cost approx. \$60 will take 45 minutes from Monash. There is a taxi stand near the school, and if you need an Uber, meet it at the Robert Blackwood Hall. You can also get there by public transport in around 70 minutes, for around \$8. You will need a MyKi travel card. These can be purchased at the Monash Campus Centre. For more information visit: <https://mess.foundation/>

13:00 - 15:00

TENOR PERFORMER'S LAB

**THE INFLUENCE OF NOTATION ON CREATIVE
PROCESSES OF CHRISTIAN WOLFF**

MUSIC AUDITORIUM

BUILDING 68

This presentation explores a selection of works by Christian Wolff, renowned early pioneer of indeterminate notational methods. **Robyn Schulkowsky** will discuss the influence of notation on creative process in the context of percussive practice and perform a selection of Wolff's works with Artists in Residence Speak Percussion. Wolff's desire 'to turn the making of music into a collaborative and transforming activity (performer into composer into listener into composer into performer, etc.)' is evident in the notation, format and instructional material of his scores, where his distinctive approaches to notation highlight the importance of the performers' interpretive decisions. The artists will interrogate Wolff's scores through both a historic context (drawing on Schulkowsky's direct experience of working with the composer) and alternative reinterpretations, with special focus on the ontology of the score and use of technology in both the delivery of notation and performed interpretation.

Born and raised in South Dakota, percussionist **Robyn Schulkowsky** has been an innovator and collaborator throughout her life. Her continuous exploration of new sound dimensions has led to the development of many new and unusual instruments. An active musician on five continents, Schulkowsky moved to Germany during the heyday of experimental classical composition. She has premiered and recorded some of the most important percussion works of the 20th and 21st centuries, working with composers including Stockhausen, Cage, Feldman and Xenakis. Schulkowsky's virtuosity has been captured on over 20 recordings, including seminal recordings of compositions by Christian Wolff and Morton Feldman.

REPERTOIRE

1. *For 1, 2 or 3 people* (1964)
Free instrumentation, ca. 10' - 40'
2. *Pairs* (1964)
2, 4, 6 or 8 players, free instrumentation,
ca. 4' - 8'
3. *Merce* (1993)
1-9 players, ca. 3' - 25'
4. *Metal and Breath* (2007)
2+ players, percussion and breath,
ca. 2' - 15'

13:00-15:00

TENOR WORKSHOP 1
IDEATION: LET'S IMPROVE
REPRESENTATION AND EDITING OF
POLYPHONIC EXPRESSION!

ROOM G01
BUILDING 68

Led by: Skot McDonald for ROLI

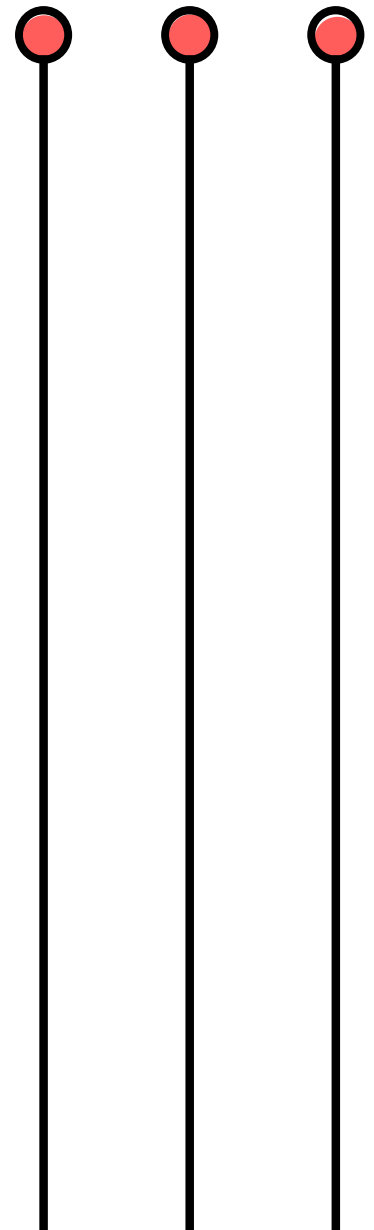
Scoring, representing and editing of expressive performance poses many challenges. MIDI for Polyphonic Expression (MPE), recently formalized as part of MIDI 2.0, allows deep per-note parameter control from expressive polytouch instruments like ROLI's Seaboard, Roger Linn's Linnstrument, or the Eigenharp. DAWs' traditional "piano-roll + parameter envelope" graphical presentations and editing are woefully inadequate.

In this workshop, we introduce MPE and review the state of score editors in popular DAWs; we will provide "hands on" access to ROLI controllers and MPE-supporting FXpansion software synthesizers, and have a group "imagineering" of possibilities for improving the industry's representation, support, and manipulation of rich polyphonic expression and control.

What can we do given the possibilities of a powerful computer GUI? Animation? Iconography? Combining Music Information Retrieval (MIR)? Transitory attention-focused information hiding / display? Our joint community needs all your ideas and experiences - academics, developers, performers, composers! Lots of drawing supplies and timtams will be provided to help you jam out concepts. We will gather up the suggestions generated into a report to further discussion and development on this topic.

Workshop hosted by ROLI (<https://roli.com/>), proud sponsor of TENOR/ACMC 2019.

SKoT McDonald, Principal Developer & Head of Sound Research. skot@roli.com



13:00-15:00

**TENOR WORKSHOP 2
USING THE DECIBEL SCOREPLAYER
COMPUTER LAB
BUILDING 68**

Led by Aaron Wyatt, programmer of the Decibel ScorePlayer

The Decibel ScorePlayer is an iPad app that allows for the network synchronised display of animated graphic notation scores. This workshop will show participants how to create scores for the app using a combination of Adobe Creative Cloud software and the companion ScoreCreator app. It will allow participants to experiment with the software in a hands on way, and will demonstrate how composers can leverage some of the more advanced features of the software, including the creation of individual parts using a combination of layers and scripts in Illustrator.

For any interested participants, there'll also be the chance to explore how the ScorePlayer can be synched up with other applications like MaxMSP, or controlled via Python scripts, including a look at how these programs are able to use the app as a drawing surface via its canvas mode.

15:00-17:00

**TENOR WORKSHOP 3
AN INTRODUCTION TO THE MUSIC
NOTATION SOFTWARE DORICO**

**ROOM G01
BUILDING 68**

Dorico is the scoring software developed by Steinberg that helps you write, print and play back music notation to the highest professional standards. Created by the world experts, Dorico combines the finest engraving of the last millennium with the cutting-edge technology of the next.

This session will serve an introduction for those people who are familiar with music notation software. We will explore the unique ways in which Dorico is fast, efficient and more 'clever' than anything else before. Using the powerful desktop publishing functions of Dorico we will explore the ways in which beautiful, content rich resources can be created easily within the software. You will experience a truly unique way in which musical elements can easily be combined with graphics and text into dynamic resources.

Workshop hosted by Dorico (<https://blog.dorico.com/>), proud sponsor of TENOR/ACMC 2019.

Michael Rohanek, currently Head Teacher of Music, TAFE NSW Ultimo



15:00-17:00

**TENOR WORKSHOP 4
A NEW MUSICAL PEDAGOGY IN ACTION
ROOM 226
BUILDING 68**

Led by Shane McKenna of DabbleDooMusic

This workshop will introduce a new music pedagogy for primary level schools based on the use of alternative forms of music notation, including animated and interactive web-based notation. The system has been designed to make music more accessible, engaging and creative for teachers and students while comprehensively covering all areas of their primary music curriculum and fulfilling all requirements from national education departments. Participants will get a chance to take part in the music making and experience this new music education system in person. Instruments will be provided. No previous musical experience is required.

Shane Mc Kenna is a music teacher, musician and founder of DabbledooMusic, a music education program and online resource using alternative forms of music notation. Shane studied music education and music and media technology in Trinity College Dublin, after which he worked as an independent researcher and developer with animated notation.

In 2012 Shane founded DabbledooMusic to focus on the use of new music notation systems to improve learning outcomes in primary schools. The program has now been used by over 52,000 children, across 1,200 schools in Ireland alone, with over 10,000 online users between Ireland, the UK and Australia.

17:00-18:00

**WELCOME TO COUNTRY
OFFICIAL OPENING COCKTAIL EVENT
IAN POTTER CENTRE FOR PERFORMING ARTS**

Drinks and small snacks will be provided at this welcome event, which includes a welcome by Professor Sharon Pickering, Dean of Arts, a formal welcome to country, and an Australian premiere performance of keynote speaker Catherine Schieve's "Ink Jungle" (1986) by members of Decibel New Music ensemble.

"Ink Jungle" is a large painted graphic score designed for two or more performers. The work evolved out of a smaller, 'random line drawing'. Schieve then took slides of the drawing at various degrees of magnification and, using multiple projections, re-enacted the creation of the drawing on a large scale to create the vertically hanging semi-transparent score. Performers readily 'throw' vocal and airy instrumental sounds through the score from both sides, as if creating a sonic hologram in the air. The score is read left to right, right to left, up to down, and vice versa. Schieve says "Orchestrating the eye movements of players then becomes important – as did invented instruments, to deal with all of this. I want to leave the pitch/time grid behind... I don't want a pitch continuum divided into discrete steps" (Notes by John Jenkins, from rainerlinz.net/NMA/upclose/Schieve.html)

18:30 - 20:00

TENOR CONCERT 1: CLOCKED OUT DUO
MUSIC AUDITORIUM, BUILDING 68



Clocked Out: Vanessa Tomlinson + Erik Griswold, special guest Lindsay Vickery

Clocked Out create and produce innovative music, interarts, and intercultural events that extend experimental traditions in engaging and thought provoking ways. They use music as a vehicle to explore central cultural issues such as environmentalism, multi-culturalism, and interactions of science and music. The creative outlet of Vanessa Tomlinson and Erik Griswold, Clocked Out's output includes original music for percussion and piano, a variety of artistic collaborations, concert series, tours, and festivals. <http://clockedout.org/>

Alex Christie "Memory Calendar with Pieces Missing" (2018)

Memory Calendar with Pieces Missing is a system of shifting and uneven cycles that overlap and interfere with each other. These cycles become a network of rhythm and texture that obscures the identity and perception of the musical material. A similar network of light is superimposed upon the sonic field and accentuates the physical space and relationships between performers. Some calendars don't tell us the specific time but rather the type of time we are in. Some memories are incomplete, blurred, and hidden.

Ryan Ross Smith "Study no. 0" (2013/2019)

Carmen Chan Schoenborn "FW: REGENERATE" (2019)

"FW: REGENERATE" is a set of re-iterated compositions taken from 3 hand-drawn graphic scores "for warren" (2006), created for Warren Burt. It is currently designed to be played in Decibel Score Player format.

Joshua Tomlinson "A Short Story" (2018)

The typewriter's singular function makes it synonymous with storytelling for me. In A Short Story the instrument is first heard alone, then progressively its sound becomes further and further removed from reality in real time. Additional sounds that help construct the narrative are triggered by a lamp, the only source of light.

Lindsay Vickery "Kurui" (2018)

Kurui was composed for Clocked Out for a performance at the Cooroora Institute. The institute's name is derived from the Gubi Gubi language name for possum: kurui. This is a piece created from transcriptions of the strange sounds that emanate from possums. The score combines graphical and extended common practice notation in an effort to mediate between possum and human sounds. The score is presented in scrolling mode on the Decibel Scoreplayer.

20:30 - 22:30

ACMC CONCERT 1: MAKE IT UP CLUB
BAR OPEN, 317 BRUNSWICK ST, FITZROY

Improvised works by Leah Blankendaal, Fernando Egido, Brigid Burke, Mark Pedersen, and Roger Alsop. FREE ENTRY for conference delegates

WED. 24 JULY

10:00-12:00

**ACMC INSTALLATION: A TREE FALLS (2019)
DRAMA WORKSHOP
BUILDING 68**

by Jack Woodbury

A Tree Falls consists of a quadraphonic speaker array with a bespoke interface positioned in the center of the array, atop a microphone stand. The interface sends input to a laptop, positioned to the side on a table. The laptop sends audio to an interface, and then out to the loudspeakers.

11:30-13:00

**TENOR PAPER SESSION 1
MUSIC AUDITORIUM
BUILDING 68**

"Animated Notation, Score Distribution and AR-VR Environments for Spectral Mimetic Transfer in Music Composition"

Jonathan Bell
PRISM-CNRS
belljonathan50@gmail.com

Benedict Carey
Hochschule für Musik und Theatre
benedict.carey@hfmt-hamburg.de

This paper seeks to make a case for a compositional ideal (the mimetic transfer of a recorded or synthesized sound to the instrumental/vocal domain) which today's technologies for animated/distributed musical notation have made more realistic than when it first appeared as a general aesthetic (with composers such as Tristan Murail and Gerard Grisey, or, in the realm of computer music, as with the practice of Jean-Claude Risset), simultaneously with the birth of the digital era in the 1970s. The concept of mimesis is here examined both as a (post) spectral compositional technique and as a common feature of many forms of musical score/representation. These theoretical considerations are then exemplified by musical examples and software demonstrations extract from the "In memoriam Jean-Claude Risset" cycle of compositions, scored for ensembles of various sizes (small chamber music group with players wearing head-mounted displays, choir and electronics, large instrumental groups with choir, and for the performance of an opera), all performed with the help of the SmartVox Score distribution system.

"Drawsocket: A Browser Based System for Networked Score Display"

Rama Gottfried and Georg Hajdu
Hochschule für Musik und Theatre
Georg.hajdu@hfmt-hamburg.de
Rama.gottfried@hfmt-hamburg.de

Presented by Prof. Dr. Jacob Sello
jacob.sello@hfmt-hamburg.de

We present DRAWSOCKET, a new platform for generating synchronized, browser-based displays across an array of networked devices developed at the Hochschule für Musik und Theater, Hamburg. Conceived as a system for distributed notation display with applications in music and spatial performance contexts, DRAWSOCKET provides a unified interface for controlling diverse media features of web-browsers which can be utilized in many ways. By providing access to browser mouse and multitouch gesture data, and the ability to dynamically create user-defined callback methods, the DRAWSOCKET system aims to provide a flexible tool for creating graphical user interfaces. Included is a discussion of the architecture design and development process, followed by an overview of the features, and syntax considerations for the DRAWSOCKET API.

"Networked Music Performance in the Old Elbe Tunnel"

Georg Hajdu and Rama Gottfried
Hochschule für Musik und Theater, Hamburg, Germany.
georg.hajdu@hfmt-hamburg.de
rama.gottfried@hfmt-hamburg.de

Presented by Prof. Dr. Jacob Sello
jacob.sello@hfmt-hamburg.de

In this paper we present a new distributed score display system currently under development at the Hochschule für Musik und Theater, Hamburg (HfMT). The project was initiated as part of a large-scale live performance in the St. Pauli Elbe Tunnel (sometimes also referred to as Old Elbe Tunnel), for 144 musicians spread out over the 864 meters of its two tubes. We describe here the background of this project and the current status of the technological and musical considerations required to achieve this event.



11:30 - 13:00

**ACMC PAPER SESSION 1
ROOM G01, BUILDING 68**

INTERACTION AND GENERATIVE COMPOSITION

"Interacting with Musical Neural Networks from the Performer's Perspective"

Charles Martin
Department of Informatics, University of Oslo
cpm@charlesmartin.com.au

This paper articulates a performer-focussed perspective on creating music with a neural network-based machine learning system. Musicians have used computers as co-creative partners in many ways, including algorithmic composition, generative agents, and machine learning musical models. New advances in deep neural networks have expanded the possibilities for machine learning in music in terms of the volume and type of data that they can learn. Deep neural networks that generate symbolic musical data and digital audio are being explored within musical composition, and a natural question is how these systems might fit within performance.

This paper unpacks this question with reference to interactive music systems developed within our lab. These include embedded neural network sequencers, artificial touchscreen ensembles that perform with a human musician, smartphone apps that respond to short musical performances automatically, and control interfaces that continue or filter gestures performed by a human. Of particular interest are systems that predict musical control data as an embodied representation of performance. Examining the designs of these systems, and taking the perspective of a performer, reveals new roles for machine learning systems to play within interactive music. These systems can act as something between a complex synth mapping and a generative model. They can exist partly as an ensemble member, co-creator, and augmented instrument. This paper argues that rapid progress in creative AI demands a practice-focussed examination of neural networks to explore their place within live performance.

"Synesthetic: Composing works for Marimba and Automated Lighting"

Christina Hopgood
Independent
christina.hopgood@gmail.com

Charles Martin
Department of Informatics, University of Oslo
cpm@charlesmartin.com.au

and Gisli Jóhann Grétarsson

This paper describes a series of explorations aimed at developing new modes of performance using percussion and computer controlled lighting, linked by electronic sensing technology.

Music and colour are often imagined to be related, and parallels have been drawn between the colour spectrum and keyboard. Some people experience a condition, chromesthesia (a type of synesthesia), where experiences of colour and sound are linked in the brain. In our work, we sought to explore such links and render them on stage as part of a musical performance. Throughout this project, tools and strategies were developed to create a performance work consisting of five short movements, each emphasising a different interactive strategy between the performer, lights, and composition. In this paper, we describe the tools created to support this work: a custom wearable lighting and sensing system, and microcontroller based OSC to DMX lighting controller. We discuss each composition and how the interactions reflect ideas about synesthesia.

**Listening to the spaces between gesture, sound and image:
reflections on audio-visual performance practice.**

Mark Pedersen
Independent
markp@chailight.com

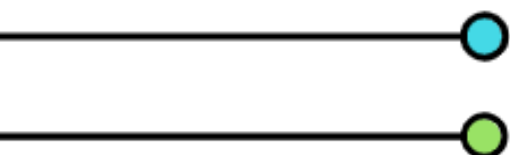
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Improvised audiovisual performance is becoming an increasingly rich field of creative practice, fuelled by the image-centricity of contemporary performance culture and increasingly affordable and powerful technology for live digital image projection. However, the domains of audio and visual creativity frequently remain separate. Both theoretical discourse and practical training tend to focus on one domain in exclusion to (or at least with significant priority over) the other.

For example, contemporary literature on new interfaces for musical expression are frequently centred on aspects of design and expressivity within the framework of music performance alone, and discussions on interactive and graphic scores for contemporary music performance focus the affordances of the visual score as a medium. Meanwhile there are limited frames of reference for examining improvised audiovisual performance as an integrated practice.

In this analysis, we focus on integrating the concept of gestural surrogacy from the spectromorphological tradition with concepts of multi-sensory feature binding. To support this investigation we utilise case-studies of three distinct approaches to audiovisual performance practice, using a combination of motiongram and spectrogram analysis along with artistic comment from the authors of each piece.





13:00 - 14:00

**TENOR KEYNOTE ADDRESS 1
MUSIC AUDITORIUM, BUILDING 68**

"World Graphic Scores: Performative Technologies of a Transpacific Avant-Garde"

Miki Kaneda: College of Fine Arts, Boston University
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In November of 1962, the critic Kuniharu Akiyama and composer Toshi Ichihyanagi co-organized An Exhibition of World Graphic Scores at the Minami Gallery in Tokyo. The exhibition reportedly drew together over 140 scores by more than forty international experimental artists whose practices exceeded the boundaries of traditional institutions. Taking the exhibition as a starting point, this presentation offers a historical perspective on the role of graphic scores in locating Japan as a meeting place for the transnational avant-garde in 1962. I argue that through a new visual language combined with portability and accessibility, the scores served as a "performative technology" in the course of producing a new global avant-garde. On a broader level, the presentation seeks to raise questions about the centers, canons, and routes of international experimental practice since the 1960s that continue to impact musicians today.

Miki Kaneda's research focuses on the transcultural movement and entanglements of race, gender, power, capital, and colonial residues in experimental, avant-garde and popular music in the 20th and 21st centuries. She has published on topics including the transnational flows of experimental music, graphic scores, art and the everyday, and video game sound. Her current book project, titled "Transpacific Experimentalism: The Unexpected Collectives of Intermedia Art," uses intermedia (a kind of multimedia art) as a vehicle to examine artistic transactions and relations of power through the work of 1960s Japanese and American musicians. She is currently Assistant Professor of Music at Boston University.

14:00 - 16:00

**ACMC INSTALLATION: 1.3 - 2.4
DRAMA WORKSHOP, BUILDING 68**

By Leah Blankendaal

1.3-2.4 is the rate at which light refracts through crystal glass. In this work tone sets have been drawn from these numbers and allocated to the instruments of a string quartet. Held against the string quartet are pure tones, generated to beat against each other in binaural patterns. 1.3-2.4 forms part of the larger sound and photography installation 'A Thousand Facets' which explored the mathematical, literary and emotional relationship between light and sound. This instrument configuration (string quartet + pure tones) was chosen in response to the photography component of the installation, which took Dutch style portraiture and refracted and warped it through crystal glass. The result was a very traditional format refracted, warped and deconstructed. There are number of aural features to this work. Firstly, with the interaction between the pure tones the aural effect is different where ever the audience stands in the room. In many ways this is an endurance work: the physical effect of pure tones played at these levels is considerable and offering a warning of this at the beginning of the piece is sometimes prudent.

This leads to a second point. 1.3-2.4 is a work that is designed for a moving audience: one that originally walked through a gallery space. It is fragmented, with no discernible melody, and with unique aural effects available at different spots in the room. If offered in a concert setting it should be noted to the audience the effects they will find by standing and moving. Finally, there is no discernible beginning or end to the work. A Thousand Facets was installed in Kurb Gallery in Northbridge in 2014.

14:00 - 15:30

**TENOR PAPER SESSION 2
MUSIC AUDITORIUM, BUILDING 68**

"Live Structures"

Linda Bouchard
composer
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Joseph Browne
matralab Concordia University, Montreal
joseph.a.browne@gmail.com

Live Structures is a research and composition project that explores different ways to interpret data into graphic notation and compositions. The Live Structures project started in October 2017, supported by an Explore and Create Grant from the Canada Council for the Arts received by Bouchard. One of the goals of the Live Structures project is to interpret data from the analysis of complex sounds into a visual musical notation. The tool, developed in collaboration with Joseph Browne of matralab at Concordia University, is called Ocular Scores™. So far, three iterations of the Ocular Scores Tool have been created, each performing multiple functions: a) the ability to draw an image from the analysis of complex sounds that can be used as gestural elements to compose new works or to compare a complex sound against another complex sound, b) the ability to draw full transcriptions of a performance for future interpretation, and c) the ability to draw images in real time and to manipulate those images to create interactive projected scores to be performed live by multiple performers.

These various applications and how they can inspire composers and performers will be described in more detail in this paper.

"Sound as Score"

Elisabeth Schimana
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As a composer and musician of electronic music since the 1980s my medium is sound. When I was asked in 2009 to compose a piece for RSO (Radio-Symphonieorchester) Vienna I had to think about how to communicate with this sound body. I opted for what I do best - sound and listening. Since that year I have developed two different methods of communication with musicians -

the live generated audio score, where the performers have to imitate the live generated electronic sounds they hear through a loudspeaker, and the audio score based on acoustic memory, where the musicians are given a set of sound samples for interpretation on their instruments and then in the performance this interpretation has to be played from memory. This paper examines the method, scoring, practice and rehearsal, as well as the artistic results using examples from The Virus series and the music theater piece Pricked and Away.

"Recent Audio Scores: Affordances and Limitations"

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A growing body of contemporary composers produces audio scores where sound is the integral mediator between the composer and performer. While many musical scores deploy some form of symbolic visual representation of sound or movement, audio scores represent information and instructions in the same domain as the performed product. This paper aims to survey the affordances and limitations of audio scores enacted thus far. Within the field, we identify two primary sub-categories associated with the temporal relations between performer and audio score: re- active and rehearsed. Louis d'Heudieres' Laughter Studies 1-3 (2015-16) and Lara Stanic's Open Air Bach (2005, rev. 2013) are examples of reactive audio scores. Representative examples of rehearsed audio scores include Carola Bauckholt's Zugvögel (2011-12) and Cassandra Miller's Guide (2013). These primary sub-categories may be combined and hybridized to varying degrees, as in Carolyn Chen's Adagio (2009). Finally, in light of our survey of the possibilities offered by audio scores, we propose some further avenues of exploration for creative practice.

14:00 - 15:30

ACMC PAPER SESSION 2A
ROOM G01, BUILDING 68

ELECTRONIC MUSIC PERFORMANCE

"Hexany Diamond 5 7 11 13' A Microtonal Computer Music Composition used Wide Blue Sounds Orbit Softsynth in a 19 note Ervin Wilson Scale"

Warren Burt
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This paper describes the tuning and timbral structures contained in "Hexany Diamond 5 7 11 13," a 10 minute stereo fixed media piece for computer sounds made with Wide Blue Sound's Orbit Softsynth, controlled by Music Wonk, and tuned in a 19 note Erv Wilson scale, made in January 2019.

The paper deals with how Orbit - a softsynth designed to make complex evolving timbres - was programmed, and patched using multiple instances of Kontakt in Plogue Bidule (to get polyrhythmic arpeggiations), and how the tuning was programmed into the different voices of Orbit. The improvisational interactive performance of the patch that took place in real time, to produce the final form of the piece, is also described in detail.

"Neurofeedback - Music for Neural Network and Electronic Sounds"

Charles Martin

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Neurofeedback is solo performance work for a predictive electronic instrument that includes an artificial neural network to transform, challenge, and take over control from the human performer. The electronic instrument provides eight continuous controllers to perform with a synthesised music patch. The neural network has been trained on embodied performance data, collected from these controllers during rehearsal, to predict the next interaction, both in terms of quantity of controller movement, and the amount of time before this movement should occur. Throughout the performance, the neural network can take control of the interface, continuing the performer's actions, transforming them into a "predicted reality", or overriding the performer in real-time. The performer can see these actions represented visually on the controller interface and must tune their inputs to guide the neural network towards musically acceptable behaviours. This feedback loop between human and predictive neural network model gives the work its name.

This work uses a mixture density recurrent neural network within the context of a live computer music performance. This algorithm is a variant of the deep neural networks often used to compose text or symbolic music but allows learning and creative generation of continuous data such as synthesiser control signals, and absolute time values. The instrument itself is an experiment in co-creation. Through it, we can examine the tension between the machine learning algorithm's role as a component within a musical instrument, and as a distinct agent that shares musical control with a human performer.

"Trialogue Across Three Time Zones - Three Computer Musicians in Conversation"

Susan Frykberg

Monash University.

Susan.frykberg@monash.edu

For the past many months three composers, from respectively New York, Vancouver and Melbourne, have been intensely involved in an internet, chat-based, three-part conversation on composition, composing systems, computer-music history, philosophy, spirituality and birds.

This twenty minute presentation brings to ACMA participants a lively and information-rich interchange through quoted conversation, music and imagery.

Composer one is well-known for her use of computers for composing, improvisation and the music software she has written for personal computers. She also does visual art in various media and has published widely on technology in the arts and its socioeconomic effects. She eschews spirituality per se, but is deeply interested in consciousness, cognition, and mythology.

Composer two is a composer-performer, media artist, educator, interaction designer, and audio producer whose creative practice explores the use of technology to enable the creation of music, media performances, installations and experiences rich in aural, visual and cultural nuances. His current work is focused on the continued evolution of his computer-assisted composition system, the Flicker Generative Orchestra.

Composer three is a sound artist and composer who has long incorporated technological, feminist, environmental and spiritual ideas via works for electroacoustics, acoustic instruments, intermedia and improvisation. She has also created music software. She is an active member of several spiritual and religious groups and has created liturgies for some of these communities.

14:00 - 15:30

**ACMC PAPER SESSION 2B
ROOM 213, BUILDING 68**

DIGITAL TOOLS

"NES-Spectrale, a Suite of Max Tools for Processing in the Frequency Domain"

David Hirst
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NES-Spectrale has been created for people who want to: Open a sound file, or use live audio; Record a portion of it in the frequency domain (FFT); Process it in some way - in the frequency domain; Render the result as audio, in the time domain; Record the result.

Inspired by the work of Zack Settel & Cort Lippe (1994), Jean-François Charles (2008), and the GRM Spectral Transform and Evolution suites of audio processors, the project adapted the patches of Jean-François Charles (2011) into a set of FFT processing tools using Ableton/Cycling 74's Max environment, with Jitter matrices storing and processing the FFT. This project's aim was to explore the notion of "timbre hacking" using Jitter matrices as the store and processing mechanism.

The NES-Spectrale suite is as follows: Interpolate-periodic, freezes two slices of sound and interpolates between their frequency content over the set interpolation period; Multi-FX-05, lets you select one of five jitter effects to apply to the FFT matrix; Playtwo, has two independent play heads that can be adjusted to play across different frequency bands at different rates; Playfour, the same, but with four play heads; Transform-Mx, uses the jit.mxform2d object, which performs a 2-dimensional matrix transform on an input matrix. It can be used to perform scaling, rotation, skewing, and perspective operations

"NES-Tools, a Signal Processing Suite for Max"

David Hirst
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Inspired by the GRM Tools suite of audio processors, this project set out to create a set of processing tools using cycling 74's Max environment. The idea was to just use only the standard objects that come with Max 7. However, many of the tools I wanted to create had already been implemented in one form or another in the standard distribution files and examples. What I have done in this project is to adapt and add to the examples created by others, and assemble these tools into their own suite. That suite implements the following: a two-pole two-zero filter (for 2 channels); granulation of a recorded sound; 5 Comb filters; up to 32 delay taps; Doppler effect simulation and panning; pitch shifter with vibrato & feedback; up to 32 simultaneous resonators

All of the tools (except NES-Brassage~) implement their processing as a separate patcher, and can therefore become their own object in Max. You can create your own master patcher that could string a series of processes together in the one patcher. A demonstration patcher provides one example of how this can be done.

"A Machine For Gigging: Towards A Computable Model of Electronic Music Performance"

Skot McDonald
Western Australian Academy of Performing Arts, Edith Cowan University.
skot@vellocet.com

A gig may be viewed as a machine for the live production and presentation of musical text by artists with equipment in a venue to an audience. It is a complex system of many interconnected parts and processes ranging over electronic, physical, virtual, biological, acoustic, and psychological phenomena. It also extends in time before and after the actual performance, encompassing preparation, logistics, setup, teardown, sustenance and maintenance. Rising technological capability also increases complexity, expectations, and the modes of contingency, mishap or failure. The same digital tools that empower Artists can also undermine a performance if their focus is lost to managing their technical ecosystem.

Technology presents a path to assisted gig management via 'smart' tools that boost robustness and reduce performer workload. This necessitates a computable model of the entire gig. The author proposes a model combining a classic Finite State Machine reflecting a "Narrative Graph" (a network of gig-state nodes, and conditions of transition between the states), and the Technical Ecosystem (a set of all devices forming the Gigging environment, some of which may have active relationships for any given narrative state). This paper outlines a framework and taxonomies of objects, properties, relationships, roles, morphologies, conditions, and sensing needed for a proposed 'Gig Engine', a software suite for exploring digital gig assistance. Following cybernetician Beer's Viable System Model, gigging is broken into a series of processes and control loops operating at various scales with a variety of goals and outcomes, and identify what information and control is needed to ensure that The Show Must Go On in the face of contingencies.



16:00 - 18:00

TENOR PANEL 2

MUSIC AUDITORIUM, BUILDING 68

moderated by Terri Hron
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Notation and Representation beyond the Eurological Tradition - Conventions, Challenges, Concepts

This panel will discuss the intersections between techniques and technologies of notation in and for musical traditions beyond western music.

Cathy Milliken (Brisbane/Berlin)

The Role of Notation for Collective Creations in Non-Western Contexts

Over the past four years I have worked with Ensemble Extrakte, a group of excellent musicians from different cultural backgrounds. Under the guidance of Sandeep Bhagwati we have amassed several programs of works that have become somewhat standard repertoire for us. They are works which are open to entirely different interpretation with every performance. In order to perform such structured repeatable musics with musicians of different notational cultures we needed a common language or point of understanding, a code which would be sustainable and non reductive. Together, we have explored different modes of approaching the process of creating and or interpreting scores that resonate with every member of the group. In this talk I shall refer to concepts of notational practice within the Ensemble Extrakte as also how these concepts including technological aids such as recordings have supported recent collective compositional projects in South Africa, Japan and Germany

Murat Gürel (Ankara)

Representing Ornamentation in Traditional Turkish Music - new Notation Tools for the Transcription of Recorded Performances

This presentation analyzes the performance of the traditional Turkish music with transcriptions of recorded performances within the frame of technical and melodic elements. The technical elements are further classified into ornamentations which comprise grace note, uncertain grace note, mordent, characteristic traditional Turkish music stepwise grace note, triple-quadruple grace note, glissando, glissando with a grace note, trill and uncertain trill; element expressions including vibrato and characteristic fast vibrato and practical notation elements as it explains them in detail. Moreover, this presentation details on melodic elements comprising fast musical passages, sequences, pedal notes and Anatolian folk music performances usage and practical notation elements as it explains them in detail. Conclusively, participants are expected to have knowledge about traditional Turkish music ornamentations and understand/analyze sub-steps with transcription by way of new notation tools

Martin Scherzinger (New York/Capetown)

Pre-Colonial African Perspectives on Beat-Formation

Using amadinda music from Uganda and mbira dza vadzimu music from Zimbabwe as a central referent, the talk demonstrates how universal (Western) theories of rhythm and meter might be re-examined in light of pre-colonial African music. Through a close analysis of the permutational logic of beat formation in this archaic music, the presentation hopes to intervene in two primary arenas—first, automatic music processing software grounded in cognitive entrainment research; and second, the question of the precisely-segmented cartographic projection of linear time itself, which today enjoys a world monopoly. The metric beat in African musical practice challenges this monopolized conception.

Ramesh Vinayakam (Chennai)

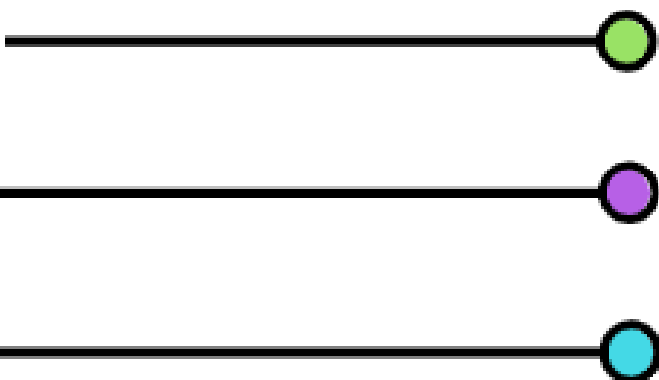
The Gamaka Box - Writing Carnatic Music Ornamentations

Raga-s are the heart and soul of Indian music. They are scales whose notes are animated by gamaka-s. Gamaka-s are movements, oscillations and ornaments which are not just ornamental but the indispensable ingredients that transform mere scales, elevating them to the unique personalities of innumerable Ragas. Thus, gamaka-s are the quintessence of Indian Music. However, gamaka-s were until now transmitted only via an aural/oral tradition. The first and only instance of a serious attempt to notate them was in 1904 by Composer Subbarama Dikshitar. The recently developed "Gamaka Box System", for the first time, offers a way to comprehensively notate gamaka-s. It's a tool of pedagogy, documentation, communication classification and demystification of gamaka-s that gives a unique insight into the intricacies of Indian music.

Sandeep Bhagwati (Montréal/Berlin)

Smruti Ranga - An Animated Score for Hindustani Musicians

Hindustani musicians use their Sargam and other Indian notation systems as mnemonic or pedagogic aids, but never in performance. When I worked with "Ensemble Sangeet Prayog" in Pune in 2015, I developed a generative and animated notation that needed to be used in performance. Musicians would see short generated musical phrases in Sargam Notation appear on a screen. Many of these phrases could be associated with one or several raga-s, others were non-typical. Musicians were called upon to integrate these phrases into their ongoing improvisations. The phrases waxed and waned organically, and they wandered from one musician to another, gained and lost in structural importance. Smruti Ranga (Colours of Memory) is a score that draws upon the specific training and raga literacy of Indian musicians, but it also challenges them to invent new ways of using these musical resources.





19:30 - 21:00

TENOR CONCERT 2

ELISION ENSEMBLE

SOUND GALLERY

IAN POTTER CENTRE FOR PERFORMING ARTS

Elision ensemble:

Daryl Buckley: lapsteel

Tamara Kohler: flute

Peter Neville: percussion

Carl Rosman: clarinet

Alex Waite: piano

Ryan Williams: recorder

ELISION has established an international reputation for its engagement with complex and virtuosically challenging aesthetics. ELISION's 16-strong membership includes some of the world's leading musicians who have defined contemporary instrumental technique with their recordings and publications. For over 30 years, the ensemble has focussed its practice on exploring musical possibilities inclusive of cross-artform and transcultural perspectives, providing inspiring models of collaborative practice.

<http://www.elision.org.au/>

Dr. Christian Dimpker "Utopia V" (2018)

The Utopia series stands for a reference to Berio, but also for the gradual disengagement of it. This was started with Utopia IV and is fully implemented with Utopia V. Utopia V is at the same time my Klavierstück V. The idea was to evade the obsolete sounds of the piano, but not to play its interior parts or prepare it in an invasive manner. Therefore, the preparation of the instrument is quite simple: heavy metal, stone and wood beams are placed on the strings. Depending on the piano model, the noise timbre varies. This is, in turn, dependent on the design of the piano. The beams are then picked up by means of contact microphones and sent directly to loudspeakers. The cover is (aside the contact microphones) used as an additional filter. The preparation enables the pianist to access a fresh, not yet worn-out soundscape.

David Kim-Boyle "5x3x3" (2018)

5x3x3 features a generative 3D score that is responsive to the timbral nuances of each of the three instrumentalists. The scores are displayed for each of the performers on three separate HoloLens, a mixed reality headset developed by Microsoft which allows the presentation of immersive, 3D visualizations

Peter McNamara "Voice of the Depths" (2014-15)

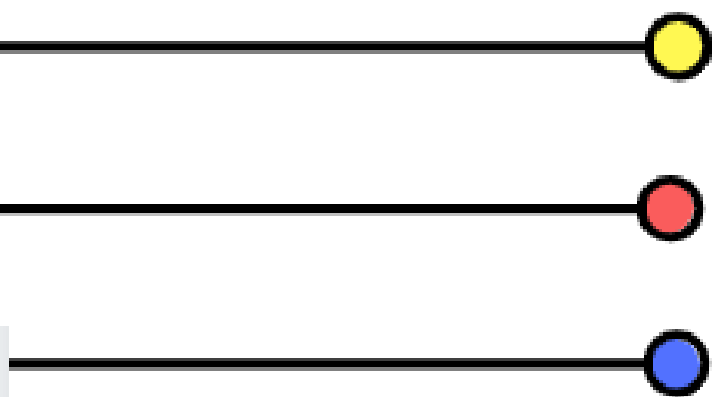
Voice of the Depths is composed for piano, percussion and pre-recorded electronics, and follows the story of Russell Keats during his deployment on the HMAS Canberra. Spoken passages of text from the letters sent home to his family, read by his brother Brennan Keats, outline and initiate the structural points of the work. The pitches from the central motif of Over the Quiet Waters form its harmonic basis, and are used as fundamentals from which other pitch material is derived from their physical-acoustic properties. This material is used to synthesise sounds in the electronic component of the work, and are re-enforced in the piano and vibraphone parts. A speaker is also directed into the piano internal mechanism to agitate the strings creating sympathetic vibrations at various points. This results in a subtle reverberation effect that blends with the electronic reverberation and creates deceptive tone colour transformations.

Paul Turowski "SQ2" (2019)

SQ2 is a multiplayer digital game for string quartet. It may also be played by another quartet of performers that are capable of producing sustained pitch with at least a one-octave range and varying degrees of loudness & spectral flux. Players control avatars via four independent channels of sonic input. These avatars engage with the game's virtual environment by distributing energy into various kinds of objects and agents in order to interact with them in different ways. While player control is operated independently, the game is structured to encourage collaborative decision-making via avatar tethering and synchronous cues. The game's primary goal is to guide the production of sound through interaction while also producing electronic sounds that may also influence musical choices. It is a game about sandbox-style creation; there is no boss to beat, no high score and no prescribed finish line. Certain harmonic relationships, rhythmic motives and large-scale formal patterns are predetermined, but the manner in which these are revealed and developed is determined in real-time by the performers.

Rebekah Wilson "F. Not F." (2019)

F. stands for Frequency. The musicians, who are located some distance from each other and connected via the Internet, respond at first independently to a score. Each musician is presented with a series of notes to select from, a tempo and a rhythmic series. The score, displayed in real-time, changes as the musician's interpretations become increasingly aligned: musical collisions cause a blurring in the score, highlighted by sympathetic electronic sounds emitted by the software.



THURS. 25 JULY

09:00 - 11:00

**WORKSHOP: MEYER SOUND CONSTELLATION
SOUND GALLERY
IAN POTTER CENTRE FOR PERFORMING ARTS**



In this open workshop, a number of artists working with sound spatialisation will workshop their pieces on the Meyer Constellation system in the Ian Potter Centre for Performing Arts 'Sound Gallery'.

<https://meyersound.com/video/monash-university/>

09:30 - 11:00

**TENOR PAPER SESSION 3
MUSIC AUDITORIUM
BUILDING 68**

"Towards Responsive Scoring techniques for networked music performances"

Rebekah Wilson
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The latent and unstable nature of networked performances, where the delayed transmission and uncertain, unstable, and compressed reception of transferred information demands scoring conceptualizations that consider the loss of the presence information traditionally expected by musicians when performing together in a shared space and time. The focus of this study is to develop electronic network-aware responsive scoring techniques that consider the primary constraints of networked music performances: i.e., latency, uncertainty, multilocalized, and digital. Using machine-learning techniques to investigate and enhance digitally mediated presence technology, scoring possibilities are discussed that promote the experience of performing together while being remote from each other—connected via a public network and subject to latency. This study also looks at compositional and technical approaches to creating responsive scores for networked music performances using analysis of transferred sound as a means to generate and control metadata and symbolic notation.

"Immersive Scores on the HoloLens"

David Kim-Boyle
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Benedict Carey[MOU1]
Hochschule fur Musik und Theatre
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The authors describe work undertaken in porting the 3D, Max generated score for David Kim-Boyle's 5x3x3 (2018) to the Microsoft HoloLens. The constraints of various network protocols for communicating between Max and the Unity 3D platform, with which HoloLens applications are built, are discussed and the deployment process from Unity to the HoloLens is described. Various optimization considerations are outlined, and the paper concludes with a discussion of feedback from performers and a brief appraisal of some of the unique aesthetic affordances of the HoloLens platform.

"Unlocking the Decibel ScorePlayer"

Aaron Wyatt
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Stuart James
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This paper discusses recent developments in the Decibel ScorePlayer project, including the introduction of a canvas scoring mode, python ScorePlayer externals, and enhancements to the ScoreCreator application. Firstly, the canvas scoring mode of the Decibel ScorePlayer app allows for other applications, such as Max, to send drawing commands to the ScorePlayer via OSC. Several examples of implementations of generative and animated notation scores are discussed and evaluated. An object model has been developed allowing for the creation of hierarchies of drawn elements. The object model defines a framework of commands that can be used to create and control these objects, and supporting examples describe the way in which scores can be developed to take advantage of this new scoring mode. Secondly, a python scoreplayer-external library has been developed, defining two python classes: scorePlayerExternal that makes a connection to the iPad, opening a UDP listening socket and letting the iPad know which port to send its replies to, and scoreObject which is responsible for creating and drawing objects populated on the canvas display window of the Decibel ScorePlayer. It acts as a wrapper to the raw OSC commands so that programming can be done using object-oriented paradigms. Thirdly, the ScoreCreator, an application developed for Mac OSX for automating the process of making scores for the Decibel ScorePlayer, has been expanded allowing for the defining of a range of score types and functionalities.

09:30 - 11:00

ACMC PAPER SESSION 3A

ROOM G01

BUILDING 68

"Exploring Hyperrealism in Electroacoustic Music"

Ryan Burge

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Stuart James

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Since the latter half of the twentieth century, concepts of 'hyperrealism' have been explored in visual art, sociology, literature and popular culture. The concepts that underlie the hyperreal include enhanced or exaggerated subject matter in painting and sculpture, virtual reality, science fiction, and in the study of semiotics. In each case, these concepts are linked with technology, its potential and its ontological effect.

Noah Creshevsky (2005) refers to 'hyperrealism' as an electroacoustic musical language constructed from sounds that are found in our shared environment ('realism'), handled in ways that are somehow exaggerated or excessive ('hyper'), whilst Barry Truax suggests a form of soundscape composition that "is the creation of a purely imaginary or virtual world, one that arguably aligns with the concept of the 'hyperreal'. Meanwhile in contemporary pop music we see a wave of nostalgia for disparate cultural artefacts of the eighties and nineties in Vaporwave, 'hypnagogic pop' and 'hauntology', manifesting a cultural hyperreal through diffracted memories.

Building on Creshevsky's definition of hyperreal music, this paper proposes and explores an expanded framework for the technique of hyperreal composition, drawing on the notion of the virtual soundscape in the work of Barry Truax and nostalgia in the work of James Ferraro, Oneohpoint Trix Never and others. This research culminates in the creation of a new creative work that will be used as a point of discussion for how the concept of hyperrealism can be applied to electroacoustic composition.

"An Approach to the Creation of Speech-Melody Works"

Jonathan Maltman

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Lindsay Vickery

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In the 2017-9 the author began a project to create works for solo instruments and small ensembles, notating with music notes the rhythms, harmonies and pitch contours of recorded speech samples, so-called Speech-Melody.



This paper discusses four works by the author hippies and yippies [2015] for baritone saxophone and tape (Spiro Agnew [1970]), small potatoes [2016] for bass clarinet and video (Donald Trump [2016-7]), chocolate cake for bass clarinet and video (Donald Trump [2017]) and prince of darkness [2017] for baritone saxophone, piano and tape (Paul Harvey [1964]). These works, all composed within the DAW (Digital Audio Workstation) Logix Pro, use various digital techniques such as splicing, pitch shifting, and rhythmic manipulation. This paper focuses on the various methods used to create scores for the acoustic instruments that were both performable and meaningfully related to the speech they transcribed through the use of audio-to-MIDI conversion, MIDI quantising, as well as spectral analysis. These approaches are compared to the processes used by historical and contemporary Speech-Melody works of composers such as Robert Erickson (1917-1997), Scott Johnson (1952-), Steve Reich (1936-), JacobTV (1951-), Robert Davidson (1965-), and Peter Ablinger (1959-).

"An Approach to the Creation of Large-Scale Site-Specific Works for Ensemble and Electronics"

Lindsay Vickery

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An approach to the creation of large-scale site-specific works for ensemble and electronics

In 2018 the author initiated the Limited Hangout: in the field project, a series of site-specific long form compositions responding to the sonic/physical environment of a chosen locale, using tools such as acoustic measurement and analysis, topographical mapping, physical structures and weather conditions of specific spaces and times. This paper discusses 3 works by the author willson's downfall [2018] for three instruments, njookenbooro [2018] for 14 musicians, bluetooth speakers and Herdsman Lake, and decompression [2019] for 144 musicians, bluetooth speakers and the St. Pauli Elbe tunnel. The works explore the use of topographical information, transcriptions of prominent environmental frequencies and the contours of bird and frog sounds and resonant frequencies of an 864 meter two tube tunnel respectively to interact with site-specific locations. The paper discusses methods of synthesising big data sets, for the generation of scores for acoustic instruments and electronic audio components and approaches to creating spatial audio environments within existing ambient natural environments. These approaches are compared to the work of composers such as R. Murray Schafer, Matthew Burtner, Marta Tiesenga, Vanessa Tomlinson and Charles Underriner as well as other works from the Limited Hangout project by Western Australian composers Sage Pbbbt, Olivia Davies and Josten Myburgh.

09:30 - 11:00

**ACMC PAPER SESSION 3B
ROOM 213, BUILDING 68**

"Small Diffusion, Big Impact: Composing Immersive Acousmatic Music for the Non-Ideal Listening Situation"

Alexis Weaver

Sydney Conservatorium of Music

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Acousmatic music is increasingly composed with the artistic goal of diffusion through large or complex speaker arrays, over more accessible methods such as the diffusion of mono or stereo works through headphones or other small devices.

In this paper, the term “small diffusion” is introduced to describe simpler, often more solitary listening experiences. By awarding a collective label to these traditional methods of acousmatic listening, small diffusion methods are raised to an equal level of legitimacy as more complex diffusion systems in our increasingly technological listening environment. Throughout the paper, the concept of the non-ideal listening space is argued as a valid and interesting space for acousmatic music. Techniques and examples of immersion in both large and small spaces are examined. The concept of immersion is then re-conceptualised beyond a 3-dimensional, spatial definition to encapsulate the small diffusion context. I employ a reflective methodology in detailing a series of works composed for small diffusion and non-ideal listening spaces, including traditional acousmatic and radiophonic music, an interactive sound story, and dance and video soundtracks. While not all related, these works engage with the challenge of maintaining spatial and musical immersion despite the possibility of increased distractions and technical obstacles in the small diffusion space. These works are thus composed for a large and likely range of listening situations, rendering the works accessible to a larger audience.

“Navigating Through and Constraining Chaos: A Morphological Approach to Chaotic Sound Synthesis”

Stuart James

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This paper presents a novel approach toward exploring the sonic language of higher-dimensional chaotic functions used for sound synthesis. This is achieved through a morphology of the control parameters driving the nonlinear system by interpolating between and numerically modulating known solutions to the chaotic functions at audio rates. The research is conducted using both empirical and practice-based methodologies. The research discusses potential control strategies including a 2D slider interface and 3D motion sensors, and how these may serve the navigation of more complex multi-dimensional parameter spaces by interpolating between the known multi-parameter solutions sets of the chaotic functions used. Furthermore, the interpolation algorithm developed allows for the distortion of the coordinate space between known solutions, allowing for a detailed exploration of the transition points between known solution sets. A number of techniques for constraining the chaotic system are explored including clamping and damping. Since chaotic systems generally follow an iterative principle, feedback is central to their operation. For this reason, feedback as a performance practice is discussed as a central tenet. A number of creative outputs are discussed, and how these have informed the development of chaos-based instruments for music composition and performance.

‘Want it to End’ - Towards a Virtual Theatre”

Troy Rainbow

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Stephanie Peters

RMIT University

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This research and creative work explores the capacity to integrate immersive theatre, live music performance and Virtual Reality. We are terming this a 'Virtual Theatre'.

Participants are led through a space wearing VR headsets. They are performed to in ambisonics using acoustic, electronic and digital instrumentation. As they are led through the space they are subjected to sensory stimulation beyond the audio-visual realm. These involve smell, taste, touch and thermoception (heat and cold).

The video is experienced from first person Point-Of-View and leads the participant through a rural Victorian landscape with a surreal and abstract overlay. Participants are left uncertain as to what they have done, but there is an implication that they have committed a heinous act.

The work (entitled 'Want it to End'), that can be seen in the documentation, was developed in 2018 and forms the basis of further research which explores the Phenomenology of Schizophrenia in the context of this Virtual Theatre. It was originally performed at Aeso Studios (The Burrow) and subsequently featured at West Projections Festival, Vivid Festival and Melbourne Music Week.

11:30 - 12:30

**TENOR KEYNOTE ADDRESS 2
MUSIC AUDITORIUM, BUILDING 68**

"Notation, Reading, and Environment : Re-inventing the world"

Dr. Catherine Schieve
catherine.schieve@gmail.com

I re-invent the world for each new work. I will discuss how in my practice of creating performance scores and performance installations, I always investigate a new concept, even a "new way of reading and being" each time. A "constant re-inventing from scratch". My methods involve re-conceiving fundamentals of reading and representation for each work. "The score" is a different world each time.

Catherine Schieve is a multimedia artist, researcher, composer, and writer originally from the US. Her academic specialisation is Performance Studies, a field combining anthropology and creative practice which she teaches in the Master of Contemporary Music program at Box Hill Institute. Among many university posts she was for 10 years an Associate of the Bard College (New York) Institute for Writing and Thinking, a transformative experience. Recent projects over the past few years include: Social Cohesion, Marginalisation and Violent Extremism in Regional and Rural Victoria: A Dual Case Study - an ethnographic study for the State of Victoria; Cage 101 Conference at Universiti Pendidikan Sultan Idris in Tanjung Malim Malaysia - as visiting artist she created a suite of documentary photos, videos, and soundscapes and a keynote performance experiencing intercultural Malaysia through its sacred and ordinary spaces; as visiting artist at the University of Wisconsin, she exhibited a 40-foot long graphic score Shading and interacted with local musicians. She creates performance installations with the Astra Music Society in Melbourne, most recently new works Experience of Marfa, Earth and Lustre, and Voices and Serpents (2016). Her engagement with performative cultures is lifelong and linked with her artistic practice. Over time her work has expanded to explore many environments, faiths and cultures, enhanced by travel. She is particularly immersed in divine chant and the creative power of sound, and is an avid photographer, soundscape collector, and video artist. Her academic training is at University of Texas (BM Hons / MM), University of Iowa (MFA), and University of California, San Diego (PhD).



13:30 - 15:00

TENOR PAPER SESSION 4
MUSIC AUDITORIUM, BUILDING 68

"The Monthly Acid Pattern – An Accessible Notation System for Acid House collaboration"

Dylan Davis
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Scholars continue to investigate how communities are built by sharing histories, norms and values within the 'third spaces' enabled by social media technologies. How can these third spaces be harnessed to explore collaborative and experimental compositional practices, and, in turn, what can practising music as a 'shareable' culture reveal about community building as it shifts to digital platforms. The Monthly Acid Pattern Group used the compositional schematic of the Acid Pattern and a particular analogue synthesizer, the Roland TB-303, as the basis for the sustained production of interpretative works using online collaborative and publishing platforms over a four-year period. This project contributed to further understanding of how the practices and cultures of music composition are shared and can build community. With the use of an emerging online platform (SoundCloud), the research project made an innovative contribution to methodologies of documenting, and enabling, the interpretative practices of an online community as it emerged. The works that were created demonstrated new possibilities for accessible modes of notation, instrumentality and compositions within digital music cultures.

"Performing the Compositional Act with Bouncy Castles, Soap and Shh"

Andy Ingamells
Birmingham City University
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My practice-based research has led to a rethinking of the relationships between composer, performer and listener in my own creative work through an interpretation of a diagram by experimental composer George Brecht. Through the reconfiguration of this diagram I have developed a framework in which the act of composition can be performed via the activities of 'reading', 'performance' and 'playing', with the focus on an expanded notion of traditional score-reading that makes the act of reading manifest onstage as part of the physical theatricality of musical performance. This approach can be used as a site for further experimentation by other interdisciplinary creative practitioners.

"Palace 64: Impossible Virtual Roller Coasters as Musical Scores"

Luke Nickel
Independent
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In Palace64, a major new multidisciplinary project combining video and chamber ensemble, I examine the ways in which the domains of music composition and virtual roller coaster design might influence one another. First, I briefly discuss existing artistic projects relating to roller coaster design. Second, I present my own early artistic explorations combining music and virtual roller coasters. Finally, I discuss Palace64. In this project, I create a new medium of score that combines oral transmissions describing imaginary impossible roller coasters with videos created using innovative 3D roller coaster design software (NoLimits 2). Using strategies pioneered by Éliane Radigue and Jennifer Walshe for interpreting imagined images and paths as musical material, I develop ways in which performers can "read" these impossible roller coasters—remembered and virtual—as scores. Ultimately through this project my goal is to create and demonstrate a hybrid artwork that exists not only as a score to facilitate the performance of experimental music, but also as a conceptual theme park ride that traverses the boundaries of possibility and impossibility in a region that marries the digital with an embodied human experience of risk and pleasure. This paper is intended as an accompaniment to the performance of Palace64 by Decibel New Music Ensemble.

13:30 - 15:00

ACMC PAPER SESSION 4A ROOM G01, BUILDING 68

"Two Perspectives on Rebooting Computer Music Education: Composition and Computer Science"

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Alexander Hunter
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and Benjamin Swift
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This paper contrasts two perspectives on encouraging the development of an electronic and experimental music scene among university students: that of composition students within a music department, and creative coding students within a computer science department. Computer music has a long history of collaboration and cross-disciplinary development from music and computing faculties. In our efforts to foster engagement with music from both music and computing students we have pursued strategies such as free improvisation performances and open work compositions from the music side; and laptop ensembles, and software engineering processes from the computing side. These approaches embrace the commonalities, and acknowledge the differences between students on both sides of this interdisciplinary field, while both producing musical performance practices.

In this research, we report on these processes and discuss contrasts between both approaches. We address the impact of new trends in both music and computing education, such as a new focus on broad-audience coding education, and music production with the academy. Finally, we evaluate the impacts of these perspectives on the students and examine the lasting computer music practices that have emerged so far.

"Practicing Creativity and the Pedagogical Benefits of 'Beat Cyphers'"

Benjamin Murphy
Box Hill Institute
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This paper demonstrates the pedagogical and creative practice benefit of "beat cyphers". Borrowing from online music community and particularly hip-hop culture practices, beat cyphers challenge participants with varied restrictions and short development time frames for composition/production projects. By focusing upon rapid development of a large body of shorter pieces, it is argued that artists achieve greater growth in their creative development than focusing upon select pieces of greater investment. Also adapted as an elective class at Box Hill Institute, this paper examines the pedagogical method and benefits of applying the beat cypher practice to academic curriculum.

"Analog Algorithms: Generative Composition in Modular Synthesis"

Alex White
University of Technology, Sydney
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The contemporary re-emergence of modular synthesisers as a popular tool for music making rejects much of the convenience afforded by advancements in music technology in the past 40 years, challenging our understandings of the relationship of electronic music composers to technology. Given the dominance of the computer in music making since the early 1990's there is a temptation to situate the modular synthesiser in counterpoint, focusing upon the tangible interface and a general shift away from the ubiquitous computer with its endless and expensive updating of software and hardware as primary drivers for the return to modular synthesis (Paradiso, 2017). I argue that generative compositional approaches, specific to modular synthesisers, are another factor that should be considered in relation to this re-emergence.

Generative compositional processes are foregrounded by the modular synthesis paradigm through systems that are designed to generate musical events and control signals, not only sound. Many module designs carry a legacy of generative processes that can be traced back to the earliest commercial synthesisers. These generative approaches exhibit generalisable attributes distinguishing them from those developed in the field of computer music.



13:30 - 15:00

**ACMC PAPER SESSION 4B
ROOM 213, BUILDING 68**

"John Cage's Lecture on Nothing: An Experimental Theatre Production"

Stefanie Petrik
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Roger Alsop
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John Cage's original "Lecture on Nothing" focused on music's experiential effects on consciousness expansion. Our adaptation uses spatial sound design & visual projections to disorientate the listener in a unique participatory installation.

Moving through the installation's space builds a unique linear narrative. This movement forces the listener to interact with the experiential intimations that John Cage was exploring in 1950.

Its 8-channel sound design makes use of memory and independent free-associations. Visual projections including elements of performance and collage techniques also present Cage's original text with a modern visual interpretation.

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"Composing Soundscapes From a Single Field Recording"

Cissi Tsang
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This paper will discuss the multiple uses of a single original field recording in relation to the author's own work, with inspiration drawn from composer Joanna Bailie's works. Bailie views the prolongation of frequencies in field recordings as a way of "freezing" a section of time, to explore the essences of the frequencies found within a particular point in time - turning the moment into a decipherable stretch of time for the mind. This elongation also allows the exploration of emotion and musicality of a moment, by exposing hidden harmonies and rhythms. The paper will discuss methods of composing with a single field recording (time-stretching, layering, and the use of effects and panning), through examining two pieces from the author - Corridor [2018] and The Insect Apocalypse [2018] - and how such a process, with its combination of artistic and technological interventions, can also create pieces that mediate on the ecological stresses found within the original field recording.

"Irene Greenwood, Sisters Akousmatica and Expanded Radio: Encouraging Feminist Communities Through Radical Transmission Arts"

Annika Moses

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Lindsay Vickery

Western Australian Academy of Performing Arts, Edith Cowan University.
l.vickery@ecu.edu.au

The radio program *Woman to Woman* (1948-1956) presented by self-described 'radical' Irene Greenwood (1898 - 1992) attempted to create a 'forum of the air' in which 'listening [was] not merely passive, but [gave] an opportunity for expression of views on the part of the listener'. Greenwood encouraged political thought and discussion in the public sphere, and through *Woman to Woman* helped to create feminist communities of active listeners across regional Western Australia. Nearly 70 years later, Tasmanian sound artists Philipa Stafford and Julia Drouhin launched the project *Sisters Akousmatica* at Next Wave Festival 2016. The duo have described the project as 'promoting women and gender diverse voices in public space' through the medium of 'expanded radio'. This practice involves large scale public transmission projects, hidden radio broadcasts, transmitter building workshops with women and children, and written research, exploring the 'potential of emergent art forms to support, promote and cultivate socio-cultural and gender minorities in the field of sound arts'.

This paper examines the objectives of *Sisters Akousmatica* (and a number of their other works including *XYL* and *Super Occult Cosmophon*) in relation to the current circumstances and context of radio art and broadcast in Australia and compares them to those of Greenwood in the 1950s. Through a comparison of the limitations and affordances of Greenwood, Stafford and Drouhin's socio-cultural contexts, an overview will be provided of the evolving circumstances of women's involvement during these periods of Australia radio broadcast history. This discussion investigates the radical possibilities of radio to promote minority voices in the public sphere and create feminist communities through collective active listening, focusing on the involvement of women and gender diverse persons living within isolated communities.

15:30 - 16:00

TENOR CONCERT 3

MONASH ELECTRONIC MUSIC ENSEMBLE

MUSIC AUDITORIUM, BUILDING 68

Andy Ingamells "Long Piece" (2018)

In performances of graphic score the visually interesting notation is usually hidden from the view of the audience. The visual aspect of the score is only communicated via sound, so that the graphic score may as well be written in traditional musical notation or ignored completely. As someone interested in the theatrical and visual aspects of musical performance, I want this act of reading to be demonstrated to the audience directly, rather than communicated via an act of translation through music. *Long Piece* is an attempt to do this. It is an outline for a situation in which musical sounds may occur, and has been conceived as a choreography for instrumentalists.

Haruka Hirayama "On Gaku" (2019)

This work will be realised with a real-time sound visualisation system programmed with DIPS, which is a plug-in software of Max. The author has originally employed the system for her work of live multimedia performance, but here she aims at using it for producing a dynamic visual score for performers/instrumentalists, exploring alternative musical notation and expression.

Ralph Lewis and Robin Meiksins "Duo Tube" (2018)

DuoTube is a work to be played on one to several laptop or desktop computers. The YouTube video (see below) functions as instrument, score, and fixed media accompaniment. With two windows of the video open, one is allowed to play as normal with the performance instructions in the upper left corner. With the other window selected, each performer uses their computer keyboard's number keys to manipulate the video. We are applying to have Monash Electronic Music Ensemble perform this work.

Performers

James Abougelis
Oliver Brown
Nat Grant
Alexander Spicer
Mirren Strahan



16:00 - 17:30

**ACMC CONCERT 2
DRAMA THEATRE, BUILDING 68**

Donna Hewitt "Permafrost" (2019)

Permafrost is a multi channel work (5.1) for live recorders and fixed electronics.

The work is composed specifically for Blackburn and is the first composer-performer collaboration between these two artists. It is inspired by Alana's comprehensive musical vocabulary with the recorder family and highlights her extensive performance experience with the instruments.

The work utilises both natural and synthesised sounds, including some recordings of Antarctic wildlife.

The work aims to entwine the textures, timbres and spatial characters of the live and pre-recorded sounds.

The work is inspired by the concept of 'Permafrost', the 'permanently' frozen earth found in colder climates.

The predicted thawing of the permafrost is accompanied by some ominous scientific predictions for the future of our climate, ecosystems and health and was at the forefront of Hewitt's mind as she composed this work.



Stefanie Petrik, Kylie Supski and Roger Alsop "Lecture on Nothing" (2019)

John Cage's original "Lecture on Nothing" focused on music's experiential effects on consciousness expansion. Our adaptation uses spatial sound design & visual projections to disorientate the listener in a unique participatory installation. Moving through the installation's space builds a unique linear narrative. This movement forces the listener to interact with the experiential intimations that John Cage was exploring in 1950. Its 8-channel sound design makes use of memory and independent free-associations. Visual projections including elements of performance and collage techniques also present Cage's original text with a modern visual interpretation.

John Robert Ferguson and Andrew Brown "Audio-visual Interiors" (2019)

Audio-Visual Interiors is a quadraphonic audio-visual composition performed by a live electronic duo. The work explores relatively uncharted territories of timbral and rhythmic space, presenting a sonic landscape that is unfamiliar yet strangely reminiscent. Both authors have developed new bespoke instruments for this work, these utilise Pure Data running on portable mobile devices. Brown explores ring modulation synthesis controlled by multi-dimensional touch gestures; this process provides a rich diversity of sonic potential whilst always maintaining remnants of the physical gestures used in performance. Effects and quadraphonic sound distribution enhance and relocate what is otherwise a simple monophonic sound source. Ferguson uses a self-made instrument that features an array of buttons and knobs wired to an iPhone, resulting in a surprisingly well-ordered assemblage that may nevertheless be liable to melt at any moment. Euclidean rhythms and sound-file granulation are at the foreground of Ferguson's sound world but the audio samples chosen very much speak for themselves, beyond the performers attempt to manipulate them. Touch Designer is used for live visuals, with both performers sending MIDI messages from their mobile devices to a laptop running visuals. Quadraphonic sound diffusion is both automated and responsive to tactile input and computational parameters. The work involves performance with live algorithms where performer agency is augmented by machine agency, as all agents exert their influence in somewhat unpredictable ways. The work emerges from the interactions amongst musicians and machines, following a tight compositional structure that still allows for moment-to-moment improvisation and surprise.

Nicole Carroll "Orrery Arcana" (2018)

The Orrery Arcana system includes a self-made modular hardware controller and custom software that allows the performer to manipulate sound during performance. The hardware controller is used to navigate systems that encompass chance operations, conceptual mapping, and data mapping, to control audio generation and processing. These process systems are based on NASA lunar data, the esoteric system in W. B. Yeats' (1865-1939) "A Vision" (1937), and the numerology and symbolism of the Tarot. The NASA data and Yeats' system both relate to moon phases. The NASA data is applied directly to synthesis and processing parameters, while Yeats' system and poetic symbolism are used for compositional and structural shape. NASA and Yeats provide the objective and subjective binaries that operate independently and collaboratively.

17:30 - 19:00

**TENOR CONCERT 4
DECIBEL NEW MUSIC
MUSIC AUDITORIUM BUILDING 68**



Cat Hope - flutes
Lindsay Vickery - reeds
Aaron Wyatt - violin, viola
Tristen Parr - cello
Louise Devenish - percussion
Stuart James - electronics
With special guests:
Daryl Buckley - lapsteel
Peter Neville - percussion
Alex Waite - organ

Based in Western Australia, Decibel are world leaders in the integration of acoustic instruments and electronics, the interpretation of graphic notations and pioneering digital score formats for composition and performance.

<https://www.decibelnewmusic.com/>

Joseph Bohigian "Stone Dreams" (2018)

"Aylis is grey this time of year. Grey-colored mountains... Frozen stones, streets, houses hardly breathe in the cold awaiting the coming of spring. The Stone Church."

"What was the reason, my God, that in Aylis, long-forgotten by you, your hills and your stones had come alive again?"

These quotes come from Akram Aylisli's 2012 novel *Stone Dreams*. The novel caused an outrage in Aylisli's home country of Azerbaijan due to his portrayal of pogroms against Armenians in Baku and Sumgait in 1988-90 and the massacre of the Armenian population of his home village Aylis in 1919. After its publication, Aylisli was denounced by the Azerbaijani government and protesters gathered in front of his house and publicly burned his books. This taboo subject matter was especially fraught given the ongoing conflict between Armenians and Azerbaijanis in Nagorno-Karabakh. The music combines the sound of stones, evoking the abandoned Armenian stone churches of Aylis, with Armenian and Azerbaijani versions of the same popular song, known as "Karoun Karoun" in Armenian and "Sana gurban" in Azerbaijani. The piece is a statement of solidarity with Aylisli in recognition that the region of the South Caucasus is a land shared by many peoples who deserve to coexist peacefully.

Alison Isadora "STEMMEN V2.1" (2019)

Stemmen is a word with multiple meanings in Dutch but three definitions; 'voting,' 'voices' and 'tuning' have particular resonance for this work. The piece was written for Stroma on the celebration of 125 years of Women's Suffrage in Aotearoa/NZ, but can be adapted for any suffrage event. For the Tenor Conference we celebrate 111 years of women's suffrage in Victoria. Stemmen explores the possibilities of inclusive democracy for both the musicians and audience. Furthermore, the contextually responsive score allows for the performance to be situated in relation to indigenous, geological and performance venue history.

The work consists of a combination of fixed and indeterminate situations; decision-making is shared throughout the ensemble with individual musicians being invited at various moments to take responsibility for the length of a section and having opportunities during the work to decide the order of pitch material and the colouring thereof.

In what I am calling an adaptive notation environment, the parts of the musicians contain extra staves at moments of indeterminacy, to allow for the inclusion of their personal contribution to the musical material. It is my hope that the performers will be willing for their contributions to become part of the score for a future performance and that the score will thus evolve to incorporate musical input from the musicians of every performance.

The audience is also implicated in the creation of the situation-specific score. Directly before the concert, the public is invited to provide text material regarding their hopes for the future of the group celebrating suffrage. These texts are gathered during the performance and offered to the musicians who both sing and recite hopes of both the audience and themselves. The cards from the audience are furthermore used as musical attributes by the harpist and pianist.

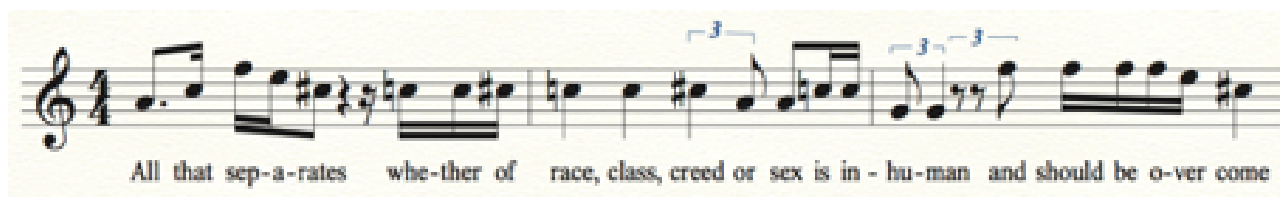
During the last section of the work, a direct vocal contribution from the audience is encouraged, firstly through communal singing of the three-bar phrase that is found on the programme notes together with the singer, and there-after through an invitation to ad lib until the end of the piece.

A short text from NZ suffragist Kate Shepherd is sung (in various forms) throughout *Stemmen*.

'All that separates, whether of race, class, creed or sex is inhuman, and must be overcome.'

As quoted in *Women, Politics and Power: A Global Perspective*, by Pamela Paxton and Melanie M. Hughes, (London: Pine Forge Press, 2007).

Text and music for audience:



Gudmundur Gunnarsson "Leyfðu hjólinu" (2017)

The score consists of moving notation on a computer screen. Notes are performed as they hit the red line. One video file is considered score, parts and electronic playback. The score can be played on a laptop or tabloid computer with the electronics sounds coming from the built in speakers, at an appropriate level – not standing out like a solo, and not being completely unnoticeable. Under no occasion should this sound be extended into a larger speaker. All accidentals apply only to each given note. The score is transposed. Accidentals The piece makes use of 6th tones (or 1/6th tones), assuming a 36 tone equal temperament, where each of the twelve chromitic tones can be lowered or raised by one third of a semitone or a sixth of a tone or 33.3 cents of a semitone either way.

Jean-Michel Maujean "Djimiluk at Waychinicup" (2019)

'Tjimiluk' is the Noongar name for Noisy Scrub-bird, and Waychinicup translates to 'place of emu'.

Waychinicup national park is located approximately 65km east of Albany, Western Australia, and is where composer Jean-Michel Maujean recorded a Tjimiluk, and used this recording as the primary focal point for this new music composition. Tjimiluk shares a unique evolutionary branch with the Lyrebird, and these are believed to be the closest relatives to the first song birds that evolved some 30 million years ago. The song sharing characteristics of Tjimiluk appear to be unique, in that groups of males occupy adjacent territories to a dominant male. Each group's shared song repertoire completely transforms over the period of approximately 6 months, meaning that songs sung today in a specific group may no longer exist -within a matter of months. A recording that was made in August 2018 has been analysed and transformed into a musical composition.

The recorded birdsong is visualised using 3D spectrogram notation, that plots frequency on a horizontal x-axis, volume on a y-axis, and the score scrolls towards the viewer - with time plotted along the z-axis. This method has allowed the incorporation custom 3D printed flutes (developed by the composer), along with traditional stringed instruments. In a blend of animated notation with western notation, Decibel New Music ensemble will engage with, and help celebrate the virtuosity and uniqueness of this iconic and endangered bird species.

Luke Nickel "Impossible Virtual Rollercoasters" (2019)

Roller coasters are powerful icons, looming in our subconscious minds and permeating popular culture. Yet, to this point, there have been very few major artistic projects exploring the aesthetics of these magnificent machines. A roller coaster, like a piece of music, can be viewed as a collection of events that are experienced in a given timespan. Jeremy Thompson makes this link between roller coasters and music using what he calls 'sequencing theory'. He likens many major coaster elements—such as lifts, drops and loops—to concepts traditionally found in Western Art Music such as harmonic progression and melodic structure.

Through the use of innovative 3D roller coaster design software (No Limits), I will explore the ways in which these traditional roller coaster elements can be used to trigger musical sounds via the creation of a digital video score. I will also explore the ways in which more abstract aspects of roller coasters, like density, material, theming, and concept—aspects that exist outside of time—can correspond with more nuanced musical ideas. Ultimately through this project my goal is to create and demonstrate a hybrid artwork that exists not only as a score to facilitate the performance of experimental music, but also as a conceptual theme park ride that traverses the boundaries of possibility and impossibility in a region that marries the digital with an embodied human experience of risk and pleasure.

Cat Hope "The Aesthetics of Disappearance" (2018)

This piece is in the memory of Paul Virilio, whose book *Art and Fear* (2003) was a huge influence on my thinking. In his 1991 book, *The Aesthetics of Disappearance*, Virilio traces out the relationship of biological optics to technologies of "production of appearance." This piece tests this idea with audibility, rather than optics. Perceptual gaps create illusions of continuity, where I attempt to highlight the paradox of empiricism in acoustic science as a kind of "motion without mobility," as Virilio attempts in his book with optics.

Seth Shafer "Law of Fives" (2015)

This piece for viola, bass clarinet, marimba, and computer uses real-time notation and requires the performers to sight-read music as it is interactively generated during the performance. Microphones placed near each of the performers allows the computer to analyze aspects of their playing which then influences the resulting notation and electronics. Attacks on the marimba, for example, change resonance characteristics in electronics while the viola's dynamic envelope influences note density in the notation. Due to the live-generative nature of the notation, the musical directions must be read from a computer display.

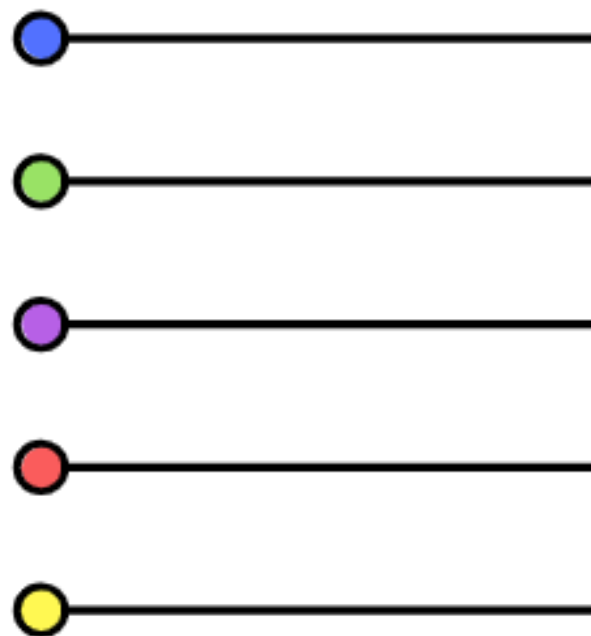
Linda Bouchard "Murmuration/Murmure: Live Structures #3" (2019)

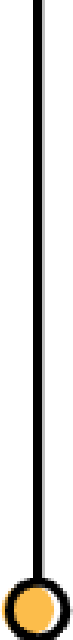
Murmuration/Murmure is a "live structure composition" for two improvisers who each interpret the other's music in a live setting using a custom software tool called Ocular Scores™. Two visual scores, which are a visual interpretation of each improviser, are projected on large screens for the performers and the audience to see. The images of the score are created in real time from the analysis of their live performance.

The composer controls the structure of the work by manipulating in real time, and with the help of presets, the graphic notation system (shapes) and the flow and density of the work, which unfolds as a collaborative improvisation and a committed interpretation of musical code.

Brigid Burke "Gloss" (2014)

Gloss was inspired by a series of nine pen and ink drawings, which were used as graphic notation for the different instrumental combinations and live electronics. The nine graphics were then integrated into the video art work which shows glimpses of the graphics in superimposed layers in conjunction with pencil drawings of squiggles depicting wire as seen in Figure 1.8. These were then photographed. The depiction of wire glosses the image with a superficial lustre.





FRI. 26 JULY

09:30 - 11:00

TENOR PANEL 3
MUSIC AUDITORIUM, BUILDING 58

"Animated Notation: The Current state of play"

Cat Hope, Ryan Ross Smith, Lindsay Vickery, David Kim-Boyle, Rebekah Wilson.
Monash Animated Notation Research Group plus special guests.

This panel will discuss the current trends and state of play for animated notation in current practice. Texts published in 2019 by Magnusson and Vear discuss the digital score more broadly, and this panel looks at the way animated notation is framed and perceived in the larger music community as well as from the 'digital notation' perspective.

09:30 - 11:00

ACMC PAPER SESSION 5
ROOM G01, BUILDING 58

"Exploring the Musical Potential of the Noisy Scrub-Bird (Djamiluk) Through Computational Analysis"

Jean-Michel Maujean
Western Australian Academy of Performing Arts, Edith Cowan University jmaujean@our.ecu.edu.au

Skot McDonald
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skot@vellocet.com

Stuart James
Western Australian Academy of Performing Arts, Edith Cowan University.
s.james@ecu.edu.au

When applying computational frequency analysis to recorded birdsong, different software and computational methods can produce inconsistent results. One of the variables contributing to this inconsistency is the non-stable frequency contours often inherent within birdsong. The primary aim of this enquiry is to analyse the potential musical features of an endangered Western Australian songbird by adopting a comparative quantitative methodological approach in identifying the intonation, rhythm, and timbral characteristics of the Noisy Scrub-bird. A single recording of a solo Noisy Scrub-bird is separately analysed by 3 researchers, conferring the results to refine the accuracy of frequency readings, and to provide a comprehensive musical and sonic depiction of birdsong.

McDonald recovers a set of audio features using a custom C++ MIR suite. In particular, the parameterization and results of two pitch detection algorithms, YIN (de Cheveigné & Kawahara, 2002) and delta phase of amplitude peaks between STFT frames are compared for accuracy and robust performance in the field recordings' audio environment. The resulting pitch trajectories are segmented into "note-traces" for further downstream symbolic analysis, such as identifying repeated melodic themes. James focuses on timbral analysis, weighted sieve pitch-tracking analysis (Puckette et al., 1998), a power spectrum histogram, an amplitude trace, and a temporal analysis through onset detection. Maujean isolates the recording into specific 'single-note' focal areas and compares frequency readings between two software analysis methods: Praat (Boersma & Weenink, 2019) and Raven Pro (Charif, Strickman & Waack, 2010). Once accurate frequency readings are determined, the intervals between isolated 'notes' are compared to ascertain whether these birdsong excerpts closely correspond with any particular scale or tuning system. Increasing the accuracy and detail of birdsong analysis can contribute to our understanding of intonation, rhythm, and timbral relationships, within or between songbird species, and may contribute toward the development of new-music compositional techniques driven by birdsong exploration.

"Listening to Invisible Ecosystems: Live Streaming Audio from Freshwater and Marine Environments"

Leah Barclay

Griffith University

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Mauricio Iregui

Griffith University

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Australia is internationally renowned for its rich biodiversity, but conservation decision making is hindered by critical gaps in our knowledge. Conservation management is particularly challenging in aquatic environments where changes can go unnoticed simply due to visibility. Listening to freshwater and marine environments with hydrophones can inspire and engage communities to understand aquatic biodiversity and protect ecosystems. Acoustic recordings have the potential to address the major gaps in our knowledge about the environment by using non-invasive technology to monitor species and document the temporal and spatial complexities of changing environments. Rapid advancements in digital technology has provided unprecedented opportunities for non-invasive acoustic monitoring that is now accessible and affordable. This paper demonstrates how underwater sound recordings and live audio streams of aquatic ecosystems can provide innovative and effective methods for monitoring freshwater and marine biodiversity. The research brings together specialists in sound art, digital technology, acoustic engineering and environmental sciences to work directly with communities to develop and deploy acoustic sensors. Every stage of the research process – from methodology to fieldwork is an equal balance between artistic and scientific perspectives.

The rise of environmental sound art has seen the emergence of artists working in a highly interdisciplinary context – initiating collaborations across sciences, activism and education, highlighting the value of sound in understanding changing environments. This resonates strongly with the field of acoustic ecology, particularly R. Murray Schafer's initial premise was that we should attempt to hear the acoustic environment as music and take responsibility for its composition (Schafer, 1977). This paper focuses on the interdisciplinary impact and outcomes from three major projects exploring the changing soundscapes of invisible ecosystems over the last decade. Sonic Reef uses sound as a call to action to protect the Great Barrier Reef, Biosphere Soundscapes maps the acoustic ecology of UNESCO Biosphere Reserves and River Listening has pioneered the new field of freshwater ecoacoustics by demonstrating that sound is a key measure of ecosystem health and presents revolutionary opportunities for freshwater conservation.

"Visualising the Soundscapes of Inaudible Ecosystems"

Leah Barclay
Griffith University
leahbarclay@me.com

Michael Towsey
Queensland University of Technology
hello@biospheresoundscape.org

This research explores the role of visualisation techniques in the new interdisciplinary field of 'ecoacoustics,' which studies sound along a broad range of spatial and temporal scales to understand environmental changes (Sueur and Farina 2015). It investigates natural and anthropogenic sounds and their relationship with the environment, including populations, communities, and landscapes in all types of terrestrial and aquatic ecosystems. Despite being a relatively new approach, there is a growing body of evidence to suggest that using acoustics to measure biodiversity provides detailed information on the health of an ecosystem (Deichmann et al. 2017; Farina et al. 2015; Fuller et al. 2015; Suer et al. 2008; Tucker et al. 2014; Tonolla et al. 2010).

This paper introduces visualisation techniques for ecosystems that are usually beyond our auditory perception – such as the ultrasonic calls of bats or infrasonic soundscapes in marine ecosystems. The study focuses on marine recordings used for whale monitoring in Australia and the USA. The North Atlantic Right Whale is the most endangered of the large whales, with an estimated population around only 350 individuals. The main dangers are shipping strikes and entanglement in fish-nets. The species is typically monitored acoustically using ocean hydrophones to detect its calls. The recordings described in the paper cover just 44 days in 2013 (towards the end of the calving season) and are part of a decade long study (Davis et al 2017). The recordings were made 15 kilometers off the coast of Georgia in the centre of the calving grounds, a region declared to be a "critical habitat" for the species. Far more audio is collected than can be listened to, so automated call recognition is essential. However, call recognisers give no indication of the larger marine soundscape in which whales are immersed.

This research uses an imaging technique known as long-duration, false-color spectrograms to visualise, rather than listen to the audio (Towsey et al 2014; Phillips Towsey & Roe, 2018). This allows biologists to visualise long duration audio at multiple temporal scales, from hours, days, months, even to years. This technique calculates acoustic indices (statistics that describe different features of the soundscape) at 30-second resolution and then combines the indices into spectrogram images, in a manner similar to false-colour satellite imagery. This technique reveals far more acoustic information than a call recogniser searching for just a single species. In order to visualise many days of recordings, each day was converted to a ribbon, 2880 pixels wide (two pixels per minute) and just 32 pixels high. By stacking the day length ribbons one on top of the other, marine biologists can see changes in the soundscape from hour to hour and from day to day. The ribbon spectrograms were then used as graphic scores for sound installations and immersive live performances designed to highlight the interdisciplinary possibilities of ecoacoustics and the role of sound in understanding the health of ecosystems usually beyond our auditory perception.



11:30 - 13:00

**ACMC CONCERT 3: 8.1
DRAMA THEATRE, BUILDING 58**

David Hirst "The Portuguese Suite (8 Channel Version)" (2018)

The Portuguese Suite follows on from the piece *Imaginação de Viseu* (Imaginations of Viseu) which was composed for the project: SONIC EXPLORATIONS OF A RURAL ARCHIVE - Electroacoustic Music and Sound Art International Competition, coordinated by Binaural/Nodar (Portugal). That work used sound sources recorded in the rural region of Viseu Dão Lafões in Portugal. The Portuguese Suite takes some of the sounds from the previous piece and processes them into purely abstract sounds using two suites of tools I developed in 2017 for Max/MSP. The first suite of tools is called NES-Tools, and processes sound in the time domain. The second suite of tools, NES-Spectrale, processes the frequency domain representation, and builds on the work of Jean-François Charles (2011). This version has been especially mixed and mastered for 8 channels using the Ambisonics Toolkit (ATK) from the University of Washington.

Jesse Austin-Stewart "Beyond Nearsightedness" (2018)

beyond nearsightedness is an octophonic work that functions as a deconstruction of the relationship between space and gesture.

Ryan Burge "Returning Home" (2019)

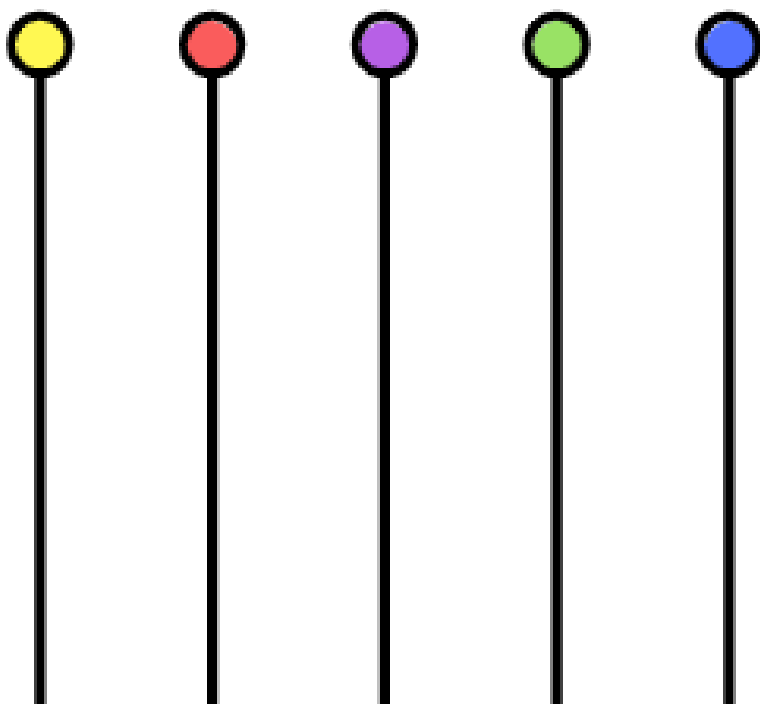
returning home brings together disparate places captured in field recordings from various locations in Perth, Western Australia. Drawing from the contemporary trends of 'hypnagogic pop' and 'hauntology' that exploit nostalgia through appealing to one's memories of the past through the use of cultural artefacts, the piece combines digital synthesis with sounds recorded using a condenser mic, coil mic and hydrophone. Noah Creshevsky (2005) defines hyperreal music as an "electroacoustic musical language constructed from sounds that are found in our shared environment ('realism'), handled in ways that are somehow exaggerated or excessive ('hyper')", whilst Barry Truax (2012) suggests a possible form of soundscape composition that "is the creation of a purely imaginary or virtual world, one that arguably aligns with the concept of the 'hyperreal'. Probing the intersection of these definitions by using familiar found sounds, articulate synthetic gestures, the electromagnetic sound of logging into social media and lo-fi production techniques such as noise, crackle and saturation, returning home explores the possibility of hyperreal music.

Stuart James "Particle IV" (2019)

Building on a series of works exploring a synergy of live acoustic feedback and spectral spatialisation, often involving the processing of a live instrument, this work builds on two new developments by the composer: the determining of multi-point spatial texture based on the multi-point spatial distributions of frequency spectra and auditory effects across the soundfield, and secondly, an application of video matrix data as a structure for determining frequency distributions across space facilitated via audio-rate controlled ambisonic equivalent panning. The work is a study designed to demonstrate the variety of spatial distributions possible using a variety of sound sources derived from found objects and field recordings. The performance will involve the live diffusion of these sound sources using an interface that allows for controlling the choreography of multi-point spatial distributions, and how these are animated and behave. This work will be adapted for the Meyer Constellation array at Monash University utilising Manifold-Interface Amplitude Panning (MIAP) with Meyers SpaceMap software and the MIAP objects for MaxMSP.

Alex White and Ian Stevenson "Meso-modulus, for modular synthesiser and digital spatialization"
(2019)

This 12 minute creative performance work for modular synthesiser and digital spatialisation explores the compositional affordances of the modular synthesiser in the context of live semi-improvised performance. The proposed performance relates to a long paper submission to ACMA 2019 Analog Algorithms: Generative Composition in Modular Synthesis and would function as a demonstration of the concepts explored relating to generative compositional processes specific to modular synthesisers. The work plays with the tension between fluid gestural morphologies and meso-scale forms of sonic repetition and pattern formation. Temporal form is developed through self-quotation enabled by the storage and recall capacities of the spatialisation system. A distanced-based algorithmic panning system creates both immersion and a sense of soloist and ensemble structure.



18:30 - 20:00

**TENOR CONCERT 5
SPEAK PERCUSSION
SOUND GALLERY
IAN POTTER CENTRE FOR PERFORMING ARTS**



Kaylie Melville
Robyn Schulkowsky
Louise Devenish
Eugene Ughetti

Speak Percussion has shaped the sound of 21st century Australian percussion music through the creation and presentation of ambitious arts projects. Internationally recognised as a leader in the fields of experimental and contemporary classical music, Speak are constantly seeking to redefine the potential of percussion.

<http://speakpercussion.com/>

Damien Ricketson "Hectic Peppermint"

Hectic Peppermint is a 6 minute open-scored composition. The work employs animated notation to facilitate coordination of spatially separated performers. The duet is characterised by an unrelenting stream of notes hocketing in rapid interlocking rhythmic patterns. The representation of the work via an animated form of visual notation (in conjunction with a click-track) is primarily concerned with supporting highly spatialised performance with the individual musicians locking into synchronised fixed media rather than each other, as may be the case with conventional ensemble practice where musicians are in close visual and physical proximity to one another. Drawing upon the visual language of video games such as Guitar Hero and Rocksmith, the animated notation is also hoped to be intuitive and available to musicians from diverse backgrounds and musical traditions

Sean Quinn "Unity" (2019)

Through an array of randomised symbols, the pairing of two interactive percussionists with a setup of various tuned and untuned instruments. Utilising a large 'gong chamber' as the feature that surround the two players allows for an intimacy and homogeneity in the performance as the duo explore the various sounds. Through the five pages; ten passages emerge to form a sequence of developments. Dispersal and unification are explored in the work as theatrical elements are employed; although not written, they can be discussed by performers in order to create the desired effects.

Labels throughout the score identify the various gongs and cymbals used, but instrumentation should be a means of development, and collaboration between the players to create an interpretive work around the given space. Alluring to the need of unification in the population, unity embodies the world within a chamber of percussive voices, calling for their audience to consider and reflect upon acceptance.

Marta Tiesenga "ROTOGLYPH" (2019)

Piece for open instrumentation / any combination of predominantly unpitched (multi)percussion instruments. Animated graphic score. The green area directs a general playhead area for group coordination over time. Performers pick a line to interpret and act as a surrogate record player needle transcribing the notation as the playhead area reaches the center of the rotating score, concluding the piece. Performers are encouraged to interpret the notation as literal transcription or as a gestural guide/tool for constrained improvised performance as dictated by ensemble preference.

Elisabeth Schimana "Virus" (2019)

The live generated electronic resonating body is the host to which the sounds of the instruments attach and adapt, they penetrate into it and use it for their replication. At first the body is immune, but during the course of the piece the body stops resisting, takes in the sounds of the instruments, and allows the viruses to multiply freely. It is a struggle and synthesis between two resonating bodies. Together they stay alive.



Ciaran Frame "Unicellular" (2019)

Unicellular is a generative iPad video score that uses research methodologies of practicing Algae scientists to explore the fascinating world of single-celled algae. Using scientific methods as a foundation for the creation of light and sound, the work takes a deeper look into the methodology of protein creation through unicellular organisms. The piece will be crafted from generative processes that use various sonification methodologies in an attempt to extract musical patterns and information from elements of DNA, visual materials and other abstract protein and plasmid data.

The score is divided into 3 movements that follow the scientific methodology of protein creation through unicellular organisms. The data and materials surrounding these processes have been collected and collated into a single database, from which animated graphic scores are generated and performed. Through performances, it is hoped that sonification through notation will uncover musical structures within ordered scientific processes and creations.

The video score operates in synchronous timing, with synced directions and sequences triggered within the video score. Performers' iPads sync to a central server over WiFi, where animated notation is generated on a performer by performer basis. Performers follow the scientific data in a semi-improvised fashion, whilst retaining cohesive musical directions to do with pitch and rhythm. In order to generate the iPad scores, performers must first undertake a 'notation survey' that determines preferences such as reading direction, density of musical information and flexibility in interpretation. Survey results feed into the generative notation system, which creates the 'score videos'.

20:00 - 20:45

ACMC CONCERT 4: LIVE ELECTRONICS
DRAMA THEATRE, BUILDING 68

Fiona Hill "Imago" (2018)

Dominique Chaseling – Flute, Judith Dodsworth – Soprano, Fiona Hill - Laptop

"She went hysterical when I was taken away and it took two people to hold her down." "I used to look into prams. I was convinced that I was going to find her." "As for my birth father, I don't know anything other than his name." These are just some of the harrowing quotes from transcripts compiled on the History of Adoption website by Monash University:<http://artsonline.monash.edu.au/historyofadoption/> Forced Adoption, one of the recent tragedies of Australian history, forms the foundation of the work 'Imago': for flute, voice and electronics (also able to be performed as solo flute and electronics). The piece responds to the multi-faceted stories of those affected by Forced Adoption as well as societal attitudes and the eventual governmental apology to victims. The work layers text derived from victim transcripts, interviews and governmental hearings with live, processed flute and voice and music concrete derived from domestic soundscapes. The work is able to be performed in stereo or quadrophonic configurations. It is controlled by a standalone Max MSP application or via a MaxMSP patch. The piece was created with funding from the APRA AMCOS Art Music award and its premiere was at Tilde~ New Music Festival, Melbourne, Australia on 19th January 2019 with Lamorna Nightingale on flute and Jane Sheldon soprano. Further funding for a recording of the work alongside other current Australian electroacoustic flute pieces has been provided by the Australia Council for the Arts. In addition an educational kit aimed at secondary high school students has been funded by the NSW Department of Education. Through extramusical inspiration Fiona ties together often disparate genres and sound worlds in an electroacoustic and spatialised context. Through the use of technology she experiments in blurring the boundaries between performer and computer attempting to create seamless integration of components and ensure maximum freedom for performers.

Pei-Fen Huang "In the Name of Love" (2018)

Dominique Chaseling – Flute, Pei-Fen Huang - Laptop

This piece of music attempts to make a live flute playing, and a pre-recorded electronic sound, similar but different mutual restraint and counterbalance. Described by music: the emotional entanglement between the two generations with blood relationship; when the protection of the previous generation for the protection, teaching and love envisioned by the next generation, fermentation becomes excessive intervention, limiting the development of the next generation, The generation is obedient to unbearable pressure, and then resists the conflicts that arise.

The flute represents in the music is a life individual that seems to be protected, but is actually not respected, restricted everywhere, and unable to maintain freedom. The original sound material of electronic music comes from the pre-recorded flute and midrange flute, representing a number of carers (elders) from the same blood relationship. In the interaction between flute and electronic music, it can be found that the flute is often restrained by electronic music and conflicts. Although in the music, the flute is very eager to break away from such restraint, and has tried to get rid of the restriction to make a monologue (solo part), Under a lot of pressure, in the end, the flute was gradually engulfed in the sound of a noisy electronic music. The music in the music is spoken in Taiwanese words, "Tia Way, Gon Lee Boon Tan, Wee Lee Ho", etc. These keywords represent the Taiwanese experience of the Japanese rule. The era, the influence of the legacy of military culture, and the national government in education, instilling traditional Chinese Confucianism, and the values of various social concepts, the father's generation to the next generation, claims to be from the language, the language traits.

Sandra González "Proyecciones Sonoras" (2018)

Kim Tan – Flute, Sandra González - Laptop

The work was composed in the research program "Temporal Systems and Spatial Synthesis in Sound Art". To compose the part of the bass flute, the Pitch Class Sets and Combinatorial Matrices were used through the External Object Library PCSlib (Pablo Di Liscia - Pablo Cetta) for Pure Data (Miller Puckette). The investigation of the relationship between the spatiality of sound and the methods of synthesis and transformation of the same was approached from the analytical approach proposed by Gary Kendall. The electronic sounds work the game with the perceptive grouping. Multichannel reverberation is used as a processing technique to create artistic content. We consider the location of the flautist, to work the "Interplay" between the perceptive grouping as a function of spatiality. They also take into account their study of containment as an auditory scheme. The implicative theory specified by Stéphane Roy is developed in the work through disturbing movements that cause disruption.



SAT. 27 JULY

11:00 - 13:00

ACMC INSTALLATION

DRAMA THEATRE, BUILDING 68

Vicki Hallett "Beyond Our Hertz-Parallel Universe" (2019)

I create sound works which open my senses to rarely heard sounds existing within the environment and which explore the space between hearing music and sound as a cultural experience and the aural vibration, not only within the being but beyond. The ongoing quest for sonic immersion and the creation of compositional devices with authenticity and inspiration finds both myself and the listener delving into an organic landscape of sound. Beyond Our Hertz explores this interest. How does another being perceive but a human may not? Can we attempt to hear the world as it is experienced by a particular organism? How do different animals in the the same ecosystem tune into different environmental signals and how are these signals fundamental to their communication and signification. Exploration is considered through umwelt - a small subset of the world which an animal is able to detect, the human lack of awareness and our small fraction of surrounding reality. How can we hear beyond the limits of our umwelt? With a shifting harmony of subpatterns and subterranean, aquatic, infrasonic and atmospheric sounds a wondrous world existing in parallel to our own limited senses is revealed.

12:00 - 13:00

ACMC CONCERT 5: VIDEO

MUSIC AUDITORIUM, BUILDING 68

Michael Spicer "A Fireside Tale" (2019)

Over the past few years, I have been regularly using abstract digital images as graphic musical notation for acoustic and electronic performances. In this context, I'm particularly interested in how the pattern recognition features of our brain can construct narratives from the abstract images and how they that can inform the musical interpretation. This piece is centred on a video score that I created by a combining a sequence of digital images and then processing them in video patcher that I made with vizzie, in MaxMSP. This particular interpretation of the score was made by assembling several recordings of modular analogue and digital synth performances. Whilst working with the score, a vague narrative based on an imaginary "history of the universe" story somehow emerged from the sequence of images. This narrative is reflected in the instrument design and performance decisions.

Cissi Tsang "Corridor" (2019)

Corridor is a piece exploring the use of a single sound source to construct a soundscape - as though the sound is mediating on itself. This piece is also about movement, loss and attempting to preserve what was left. The original field recording was made in an underpass in Neerabup National Park, in the northern suburbs of Perth, Western Australia. Neerabup is an important stretch of bush for two main reasons - firstly, it acts as a wildlife corridor for native wildlife (particularly the many native birds) and secondly it incorporates and protects part of an ancient Aboriginal migration route, which is now a walking trail called the Yaberoo Budjara Heritage Trail. The piece was then constructed by overlaying multiple versions of the original recording together, using a mixture of time stretching (by 800%, 400%, 600% and 200%), effects (delay, resonators, doppler) and panning. The resultant composition was then turned into an audio visualisation using Trapcode Sound Keys and Trapcode Form, in Adobe After Effects.

Barry Hill "The Sound of a Sunrise..." (2019)

This work is an automated data sonification and video recording captured at a specific geographic location, time and date (Sunrise January 1st 2019). The recording seeks to be a representation of the environmental energy exchange between human technology and the natural environment using data remotely hacked from a wi-fi data server designed to monitor the performance of a prototype mobile solar power generator. The stereo soundscape is created using music and data networking software (Raspian Code, MAX 4 Live, Ableton) that continuously measures the amount of sunlight striking the photovoltaic solar panels of the power generator. The system creates a musical 'composition' that is autonomously controlled and manipulated by the patterns of sunlight present in the immediate environment at the time of the recording. The soundscape comprises four distinct melodic voices that represent or sonify energy consumption, production as well as battery storage voltage and capacity data. The audio work is experienced as a polyphonic linear melody that moves through a chromatic chord progression. A synchronised video image accompanies the soundscape that allows the audience to experience the changing visual imagery of the environment during the data sonification recording.

The video image is captured from Woodford Folk Festival Hilltop stage looking south east toward the sunrise across the Sunshine Coast Hinterland. Creative themes imbedded within the work include data sonification, acoustic ecology, computer engineering as art and the age of the anthropocene. The work is inspired by broad themes of environmental awareness, Maddrell's (2010) "polyvocal landscapes" and Turrell's "Sky space" visual art installations.

Leah Barclay "Migration Patterns: Invisible Ecosystems" (2018)

'Migration Patterns: Invisible Ecosystems' is a 16-minute surround sound live performance (8 channels). All sounds featured in this piece were recorded with hydrophones in Queensland, Australia.

The ocean is often an invisible ecosystem, a complex acoustic environment, where marine life is reliant on sound to communicate and survive. Sound is felt, reflected and absorbed in aquatic ecosystems. It propagates underwater at different speeds and is affected by temperature, pressure and salinity. The impacts of climate change are often very visible in terrestrial environments, yet dramatic changes in marine ecosystems are going unnoticed simply due to visibility. Increased anthropogenic noise and rising temperatures continue to cause unfathomable ecological disruptions that are dramatically transforming the acoustic ecologies of our oceans.

'Migration Patterns: Invisible Ecosystems' is an immersive performance exploring the fragility and complexity of marine life that live in a world of sound and vibration. Drawing on a large database of hydrophone (underwater) recordings from the coastline of Queensland, this work traces sonic migration patterns and shifting ecologies from the smallest micro-crustaceans to the largest marine mammals on the planet. The recordings focus around the Great Barrier Reef, Great Sandy Biosphere Reserve and K'Gari (Fraser Island), a major transitory point for humpback whales on their southern migration. The whale song continues to adapt and evolve in response to changing environments and the recordings are contributing to ongoing scientific research on the value of aquatic acoustic ecology in climate action.

This performance immerses listeners in the depths of marine ecosystems and transposes infrasonic and ultrasonic recordings into perceptible ranges. The soundscapes are layered and sculpted into an immersive sonic environment that navigates the ocean through auditory data and embodied listening. The creative development of Migration Patterns has been supported by the Queensland Conservatorium Research Centre and Griffith Climate Change Response Program at Griffith University. Additional hydrophone recordings for this project have been provided by Marine Biologist Elisa Girola at JASCO Applied Sciences.

13:30 - 14:00

PERFORMANCE

MUSIC AUDITORIUM, BUILDING 68

Jeremy Ham "Improvising Polythryhmic Space"

FUNKarchitects

jeremy@surfcoastarchitecture.com.au

This work is the outcome of the recently-completed PhD by the author, with technological development by Use Woessner and Joachim Kieferle. Improvising Polyrhythmic Space is a dynamic Virtual Drumming Environment (VDE) that integrates live digital drumming performance, virtual reality and virtual instrumentation (VI+VR). The VDE derives musical and spatial output from the digital drum kit to generate a musico-spatial performance environment.

Improvising Polyrhythmic Space involves live improvised drumming performance with highly processed sound output and a spectacular spatialisation in VR (Performer 1). The second performer, a trained dancer wearing a VR headset, interacts with this spatial output through bodily engagement in both the musical output from the drummer and the spatialisation in VR.

Projections of this spatial output (as driven and experienced by the drummer) are directed into a performance space to be experienced by the third party, the audience. Projections are designed to represent drumming notation as 'polyrhythmic event-time molecules' that link dynamic note events in time and space that are projected into virtual space. Using a trigger on the digital drum kit, collections of drum patterns and phrases can be generated and reviewed as static 3D objects in virtual space.



TENOR EXHIBITIONS



EXHIBITION
NOTATION
SIR LOUIS MATHESON LIBRARY

Curated by Dr. Ryan Ross Smith with assistance from Jacqueline Waylen and the library staff, and the Monash Notation Research Group.

The Sir Louis Matheson Library will feature an exhibition of musical scores and artefacts that represent the Tenor community and notational exploration.

EXHIBITION
SUB DECORATIVE SEQUENCES
LINDEN NEW ART GALLERY



Cat Hope's "Sub Decorative Sequences"
Linden New Art Gallery until August 31

Taking the decorative elements of Linden's interior and exterior design as a point of inspiration, Cat Hope has created unique graphic scores that will be displayed in the gallery and performed by musicians in a series of special events. These scores will integrate elements of low frequency sound, which has been an ongoing focus in her practice.

26 Acland Street, St. Kilda 3182
Free Entry Tuesday – Friday 11am – 4pm, Weekends 11am – 4pm

<https://lindenarts.org/exhibitions/cat-hope---sub-decorative-sequences--2019>



GENERAL INFORMATION

EATING ON CAMPUS

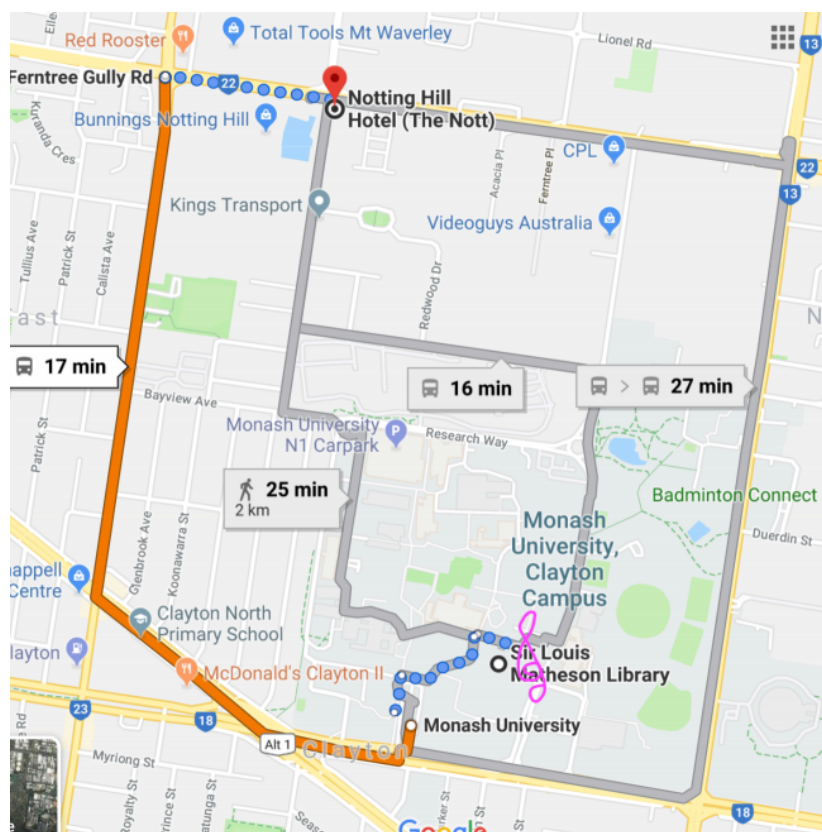
There are a number of food options on campus, with the campus centre located just a short walk away from the Sir Zelman Cowen School of Music. Many of them are open into the evening and on Saturdays, so there should be no shortage of options if you're feeling peckish during the conference. The campus centre includes Grafali's Coffee Roasters for coffee and deli-style rolls, wraps and salads; Guzman y Gomez for Mexican; Noodle Noodle for Asian-style noodle, rice and soup dishes; Papa Rich for Malaysian; Roll'd for Vietnamese inspired food; and Subway, amongst other options. Slightly further afield, below the residential colleges, there's Joe's Pizzeria and Schnitz. And Script @ Jazz Club next to the Sound Gallery offers a bar and bistro setting.

More information can be found at <https://www.monash.edu/food-and-retail>.



CONFERENCE DINNER AND POST CONFERENCE DRINKS

Notting Hill Hotel
260-262 Ferntree Gully Rd
Notting Hill Vic 3168
www.nottinghillhotel.com



TRANSPORT

TO AND FROM MONASH UNIVERSITY CLAYTON CAMPUS

By train

Dandenong, Pakenham or Cranbourne line train to Huntingdale Station, then a 601, 630 or 900 bus to campus.

By bus (stopping at the campus bus interchange)

601: Huntingdale Station - Clayton campus (7:02am-9:38pm Mon-Fri, leaves every four minutes during semester, every 12 minutes during semester breaks)

630: Elwood - Clayton campus

631: Waverly Gardens - Southland Shopping Centre

691: Bayswater - Waverly Gardens

703: Blackburn - Middle Brighton

733: Box Hill - Oakleigh stations

737: Croydon - Clayton campus

802/804/862: Dandenong - Chadstone Shopping Centre (different routes)

900: Rowville - Caulfield station, via Clayton Campus

Other buses

742: Eastland - Chadstone shopping centre, stops behind Clayton campus

800: Dandenong - Chadstone, stops on Dandenong Road, about 0.5km from Clayton campus

Parking

Ticketed car parking (payable by cash, app or credit card) is available directly opposite the Sir Zelman Cowen School of Music, 55 Scenic Boulevard, Monash University Clayton Campus.

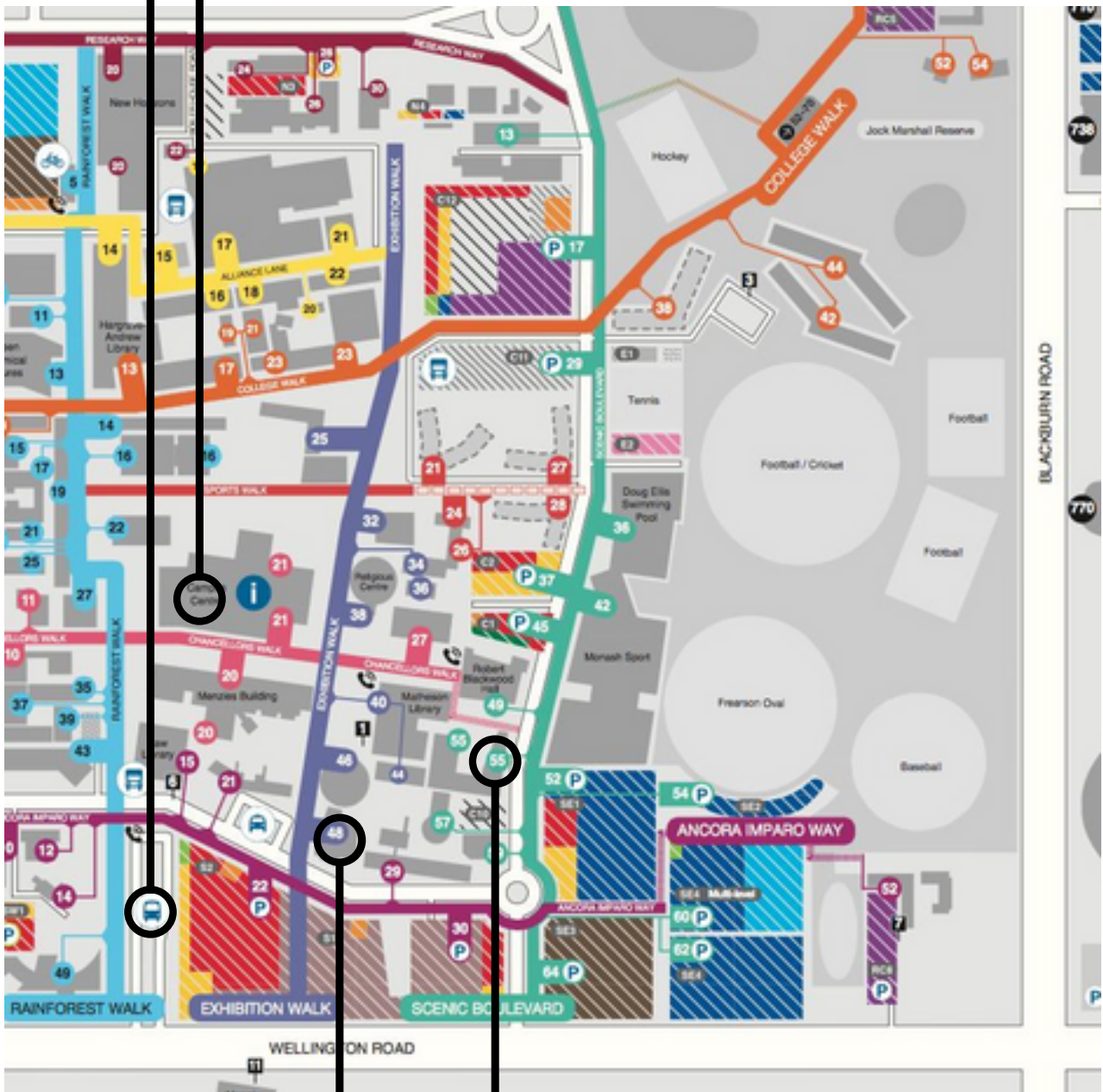


MAP

MONASH UNIVERSITY CLAYTON CAMPUS

Bus loop

Campus Centre
21 Chancellors Walk



Ian Potter Centre for
Performing Arts
48 Exhibition Walk

School of Music
Building 68, 55 Scenic Boulevard
Sir Zelman Cowen School of Music

NOTES



ARTS.MONASH.EDU/MUSIC

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