CREATEWORLD 2017
CREATIVITY ON THE MOVE

Conference Guide

AUC

Contents

Welcome

Welcome to **CreateWorld** - now in its 11th year, and the product of a wonderful and ongoing partnership between the AUC and the Queensland College of Art at Griffith University.

This year, our theme is "Creativity on the Move". The ascendancy of mobile computing is a defining characteristic of computer technology over the last decade. The increasing power and decreasing size of mobile computing platforms has created new opportunities for teachers, artists, performers, developers, gamers and people in almost every other walk of life, allowing them to discover, create, explore, and share experiences in new ways. For CreateWorld 2017 we want to take a closer look at how mobile devices empower us, to explore the ways in which we interact with them, and consider what's over the horizon..

The major conference tracks include peer-reviewed papers, presentations, workshops, an exhibition, and a performance that reflects upon Bill Duckworth and Nora Farrell's engaging presentation on iOrpheus, the iPod orchestra project, at CreateWorld 2007.

No AUC event would be a success without the hard work put in by the paper authors, session and workshop presenters, exhibition contributors, and partners, and we thank them all for the many hours they've spent preparing, as well as the time they've given up to be part of the conference.

I'd particularly like to thank my co-chairs, Daniel Della-Bosca, Seth Ellis and Dale Patterson for the substantial work that they've done to bring everything together, and Rae Cooper for her extensive work in promoting CreateWorld on social media.

I hope that you find that the next 3 days inspire you, and that they are a rewarding and valuable use of your time that provides you with new perspectives on creativity.

I wish you a great conference!

Tony Gray,
Chair, AUC

Our Code of Conduct

We aim to provide welcoming and professional environments so that people regardless of age, race, gender identity or expression, background, disability, appearance, sexuality, walk of life, or religion can work together to share experience in the use of Apple technology.

Please be respectful of others and be courteous to those around you. We do not tolerate harassment or offensive behaviour.

Complaints about harassment or offensive behaviour may be made to the conference organisers. All complaints will remain confidential and be taken seriously.

Any person asked by an organiser, convenor or moderator to cease harassing or offensive behaviour must comply immediately.

At the discretion of the organisers, a person violating our code of conduct may be excluded from the conference without refund.

Unacceptable behaviour includes, but is not limited to:

- offensive verbal or written remarks related to gender, sexual orientation, disability, physical appearance, body size, race or religion
- sexual or violent images in public spaces (including presentation slides)
- deliberate intimidation
- stalking or following
- unwanted photography or recording
- sustained disruption of talks or other events
- disruptive intoxicated behaviour
- inappropriate physical contact
- unwelcome sexual attention
- sexist, racist, or other exclusionary jokes

Our full code of conduct can be found at:

> http://auc.edu.au/policies/code-of-conduct/

Program

WED 29 NOVEMBER

10:00 Registration, Tea & Coffee Available

10:45 Welcome and Conference Opening - S05 QCA Lecture Theatre, Room 2.04

11:00 Keynote - Dr. Gary Grant
S05 QCA Lecture Theatre, Room 2.04

12:00 Lunch
S02 Webb Centre, Room 4.05B

1:00 Papers Track
S02 Webb Centre, Room 4.02E

1:00 Augmented Reality in Education …
Stephen Atherton
1:45 Using VM Apps to Build Basic …
Garry Falloon
2:30 Mobile Listening: Augmenting Environ…
Leah Barclay
S02 Webb Centre, Room 4.02F

3:00 Afternoon Tea - S02 4.05B (Webb Centre)

3:30 Exhibition
S02 Webb Centre, Room 4.02A

4:30 iOrpheus Panel, followed by iOrpheus Reflections Performance
S02 Webb Centre, Room 4.02E, then outdoors
Leah Barclay

Program

THU 30 NOVEMBER

Time			
9:00	**9:00 Papers Track** S02 Webb Centre, Room 4.02E	**9:00 Workshop: Unity and ARKit** S02 Webb Centre, Room 3.07 Mac Lab	
10:00			
11:00	**11:00 Keynote - Dr. Troy Innocent** S08 Griffith Film School, Room 2.14		
12:00	**12:00 Lunch** S02 Webb Centre, Room 4.05B		
1:00	**1:00 Papers Track** S02 Webb Centre, 4.02E	**1:00 Workshop: Teaching Coding on the iPad** S02 Webb Centre, 4.02F	**1:00 Workshop: Adobe Draw + Capture** S02 Webb Centre, 4.02C
2:00			**2:00 Workshop: Adobe Premiere Clip** S02 Webb Centre, 4.02C
3:00	**3:00 Afternoon Tea - S02 Webb Centre, Room 4.05B**		
4:00			**3:30 Workshop: Adobe XD** S02 Webb Centre, Room 3.07 Mac Lab
5:00			
6:00			
7:00	**6:30 Conference Dinner** Ship Inn		
8:00			
9:00			

Program

FRI 1 DECEMBER

Time			
9:00			**9:00 Workshop: Touch Designer** Jason Haggerty S02 Webb Centre, Room 4.02C
	9:30 State of the AR Iain Anderson **10:15 Mix Your World with Holograms** Thomas Verbeek S02 Webb Centre, Room 4.02F		
11:00	**11:00 Keynote - Dr. Tim Kitchen** S02 Webb Centre, Room 4.02F		
12:00	**12:00 Lunch** S02 Webb Centre, Room 4.05B		
1:00	**1:00 360° Photos and Videos...** Ian Anderson S02 Webb Centre, 4.02F	**1:00 Workshop: Adobe Character Animator** S02 Webb Centre, 3.13	**1:00 Workshop: Wayfinding in Playable Cities** Troy Innocent S02 Webb Centre, 4.02D
2:00	**2:00 Papers Track** S02 Webb Centre, 4.02E	**2:00 Workshop: Adobe Dimension** S02 Webb Centre, 3.13	
3:00	**3:15 Conference Close - S02 Webb Centre, Room 4.02F**		
4:00			

Keynotes

Dr. Gary Grant

Dr. Gary Grant is the Deputy Head (Learning and Teaching) in the School of Pharmacy at Griffith University, teaching pharmacology and pharmacotherapeutics across the Health Group. He successfully completed a PhD from the University of Port Elizabeth South Africa specialising in Medicinal Chemistry and Cellular Biology in 2003, and in 2010 Grant completed a Graduate Certificate in Higher Education that sparked a passion for learning and teaching innovation.

His scholarship of learning and teaching now focuses on capturing a virtual walk-through of a patient's journey through the healthcare system. His practice incorporates the use of panoramic images coupled with mixed-reality, 'choose your own adventure' simulation, and gamification. In 2017 he was awarded a Group Learning and Teaching Citation for innovative and engaging activities. Dr Grant has been able to develop a range of innovative learning and teaching resources to support student learning in health disciplines through effective cross discipline collaboration.

Dr. Troy Innocent

Troy Innocent is an artist, academic, designer and educator whose hybrid practice traverses multiple disciplines. His public art practice incorporates pervasive game design, augmented reality, and urban design supporting a long-term investigation into interactive and speculative experiences of the city as an emergent process.

In 2017 Innocent was awarded the Melbourne Knowledge Fellowship to research and develop playable cities in the UK and Europe leading to a crossdisciplinary collaboration with urban designers, policy makers and creative facilitators to transform the city through play. This approach is also central to his public art practice through 'urban codemaking' – a system he developed for situating play in cities such as Melbourne, Istanbul, Sydney and Hong Kong. Innocent teaches pervasive game design at Swinburne University; and is represented by Anna Pappas Gallery.

Dr. Tim Kitchen

With over twenty years of teaching and education leadership experience in Melbourne, Dr Tim Kitchen is currently Adobe's Senior Education Specialist for Asia Pacific. Tim regularly liaises with government officials, schools, universities, Adobe partner companies and organisations with a focus on enhancing creativity in education. He also manages the Adobe Education leadership and active use programs throughout Australasia and supports the professional learning activities within the Adobe Education Exchange (https://edex.adobe.com) which now has over 430,000 members. A passionate advocate for creativity in education, and a well-recognised education thought leader in Australia, Tim is a regular writer and presenter for a wide range of national and international journals and conferences.

Exhibition

Contemporary creative practice across the art and design disciplines are increasingly exploring the intersection of digital technology, virtual experience, and the physical world. This ranges from the use of handheld devices, to AR and VR, to projection installations, and beyond.

The **Creativity on the Move** exhibition brings together a variety of works from Brisbane-based practitioners. Some are installations; some are performances; some are screen-based works. In additions, we're pleased to be hosting several works by postgraduate research students in the Digital + Media program at the Rhode Island School of Design, one of the US' premier digital arts courses. These works are shown in video representation.

Several works will be on display in on the 4th level of the Webb Centre, in the midst of the conference, throughout the duration of CreateWorld. In addition there will be an informal reception and performance event Wednesday 29 November 3:30-4:30, during which several temporal and mobile works will be on view.

In addition to the conference exhibition, we would like the delegates to be aware of Phoebe MacDonald's solo exhibition, **Happy Medium**, in the Project Gallery on level 2 of the Webb Centre. This show of sculptural works highlights the use of both digital and physical processes in a way that is deeply relevant to CreateWorld's concerns.

Performance

Mobile Listening: Augmenting Environments and Connecting Communities with Sound

Dr Leah Barclay, Queensland Conservatorium Research Centre, Griffith University

Sound has a profound ability to make us feel present and connected to our surrounding environment. Recent years have seen a proliferation of site-specific audio works exploring the possibilities of mobile technologies and locative media in place. This means at any given moment in an urban environment, we could be moving through a sound field of voices, music, memories and sonic art dispersed invisibly throughout the places with inhabit. While this material is available only to those with mobile devices and knowledge of the locative experiences, the advancement of new technologies and the accessibility of mobile devices means this field presents new opportunities for exploring our social, cultural and ecological environments through sound.

In the 2007 CreateWorld keynote, pioneering media artist Nora Farrell remarked that the future of computing is in the mobile phone. She believed it was the most valuable platform to focus our energies as creative artists. As locative media and augmented reality audio shifts into mainstream culture, she was clearly correct. This presentation traces creative explorations with locative sound stretching across a decade of practice at the Queensland Conservatorium Research Centre, all inspired by the innovative work of Nora Farrell and composer William Duckworth.

Beginning with the ground breaking work iOrpheus – an iPod Opera conceived by Duckworth and Farrell – this research explores the impact of iPods, iPhones and iPads across six interconnected projects. Ranging from the first live performance with iPads in remote Australia to spatial sound walks in Times Square and augmented reality audio on the Eiffel Tower – these creative works draw on sound walking, mobile technologies and locative media to investigate the role of sound in achieving presence and connection to place and communities. This presentation highlights the legacy of Nora Farrell's creative and technical innovation and explores the value of mobile technologies in understanding and interrogating our relationship with places and communities through sound.

iOrpheus Reflections (Panel and Performance)

In August 2007, New York based composer William Duckworth and pioneering media artist Nora Farrell worked with the Queensland Conservatorium Research Centre on a Fulbright Senior Specialist Grant to create a world premiere of iOrpheus, a ground breaking iPod Opera merging podcasts with live music, dance, installation, fire and a mobile sound garden in the South Bank Parklands. The project re-enacted the story of the mythical musician Orpheus in five acts across various locations in South Bank Parklands with audiences shifting between environments as the immersive story unfolded through interdisciplinary installations and performance.

As the Queensland Conservatorium Research Centre embarks on a documentation project to map the impact of this innovative work over the last decade, this panel and performance reflects on the legacy of iOrpheus with a participatory sound walk on mobile phones and site-specific performance in South Bank Parklands.

iOrpheus Reflections celebrates the life and work Nora Farrell, who sadly passed away in 2017.

To participate in the sound walk and performance, please download the free app AURALITY to your device (iOS and Android).

Papers Track

Each session runs for 20 minutes, with 5 minutes breaks between sessions.

1:00 Wednesday - S02 Webb Centre, Room 4.02E

1:00 Combining Cooperative Design Patterns to Improve Player Experience

Lachlan Bunker & Reza Ryan

Previous research has identified several cooperative design patterns used to facilitate cooperation in games. The effect that these patterns have on player experience individually had been researched, and it has been found that closely-coupled cooperative design patterns have the greatest effect on player experience. However, no research has yet been done into the effect that combining these patterns can have on player experience. Therefore, this research investigates if combining closely-coupled design patterns can improve player experience. Three patterns were chosen to combine: limited resources, interaction with the same object, and complementarity. A prototype game was made for each combination and participants were asked to play the games, and provide feedback on their experience. The combinations were complementarity and interaction, complementarity and limited resources, interaction and limited resources. Based on the games used in the experiment, the results of combining patterns has shown no effect on player experience.

1:25 A Generic Architecture for an Ecosystem of Autonomous Artificial Animals using Dynamic Considerations

Christopher Osmond & Reza Ryan

Using Artificial Intelligence and Non-Player Characters in games has begun to increase rapidly. This is due to both player expectations and availability of new hardware and software technology (Dragert et al, 2012). Artificial Intelligence can increase a player's immersion and experience with a game as the player see realistic and dynamically reacts to occurrences. However, there is a lack of generic design and implementation of Artificial Intelligence systems that employ more complex algorithms that can be easily integrated and scaled. A common example of a scenario that needs a generic Artificial Intelligence system is an ecosystem of autonomous artificial animals. This research aims to design and implement this system for a simulated virtual forest environment that resembles forest wildlife. This system will employ the Utility AI theory and dynamic considerations to create an ecosystem of autonomous artificial animals. The generic structure makes us enable to scale up our system easily by adding more species in the forest with minimum changes. This design for this system will be shown as well as a walkthrough of the implementation of the system in Unity3D.

1:50 Repurposing Augmented Reality Browsers for Acts of Creative Subversion on the Move

David Sargent

Consumer facing Augmented Reality (AR) technology offers innovative new ways for consumers to engage and interact with brands and products via interactive advertising and experiences. Conversely, this technology also creates new channels that can be exploited and subverted by those who wish to generate critical reflection of consumerist culture. This paper aims to highlight that consumer AR technology presents new and unique opportunities for activists interested in subversive communication.

2:15 Complete Cinematic-style Immersion: Improving Interactive Music Soundtrack Design for the Dungeons and Dragons Table-top Roleplaying Game

Michael Drew & Ross McLennan

Traditional table-top roleplaying games offer a more agile, imaginative and physical experience than video games. The table-top roleplaying game, Dungeons and Dragons, has been popular since its creation in 1974 by American game designers, Gary Gygax and Dave Arneson. The game involves players roleplaying characters while the Dungeon Master (or DM) describes the game's world, its narrative and controls destiny with a set of many-sided di. In recent years, DM's have been attempting to seamlessly integrate sound effects and music into the gameplay to create a more cinematic experience for the character players. This paper explores the efficacy of these attempts and suggests an improved method for the creation and control of interactive music to enhance cinematic-style immersion during gameplay. Utilising Apple's Logic Pro software to explore conventions of film and game music composition and Audiokinetic's WWise audio middleware for integration into game engines like Unity and Unreal, a final prototype iPhone app will be demonstrated. This prototype has the potential to greatly enhance the Dungeons and Dragons game experience, but also has the capacity to be incorporated into myriad other table-top roleplaying games that exist on the market.

2:40 Millennials, Politics & Visual Communication

Rae Cooper

There is a growing decline in political engagement amongst young Australian voters. Simultaneously, we have a growing number of digital platforms designed to assist voters in making choices, understanding their preferences and ultimately – who to vote for. This paper explores a shift in response to the issue of political apathy, through the design of a new online platform. By moving the focus from political science to visual communication design, this new concept aims to engage a contemporary understanding of design activism as a mechanism of political empowerment.

9:00 Thursday - S02 Webb Centre, Room 4.02E

9:00 Island Healing: A Global Exploration of Sound Healing Ideas and Practices and the Implementation of These Into Music Intended To Make Peace With Place

Clara Durbridge & Ross McLennan

Sound and music have been linked to healing since early civilisation. Likewise, in modern times studies demonstrate sound and music as effective methods in decreasing anxiety, accelerated heart rates and blood pressure. The aim of this paper is not to prove or disprove the efficacy of sound as a healing agent, but to define and explore sound healing as a relatively new field of study, and then to incorporate its ideas, techniques and instruments into an original music composition intended to heal, through sonic metaphor, the damaged natural world. The paper documents a journey from one side of the Earth to the other – with nothing but an iPhone – to capture and record the concepts and practices of modern and ancient sound healing. The paper culminates in the incorporation of these ideas and practices into original music created within Apple's flagship music software, Logic Pro X. It is anticipated that this study and its resulting music will inspire other composers and artists who are seeking to experiment with their own creative practice and possibly incorporate aspects of sound healing into their own work.

9:25 Using Technology-based Devices to Boost Motivation when Lettering by Hand

Elizabeth Reed & Dominique Falla

An auto-ethnographic perspective on using technology-based devices to boost motivation when lettering by hand. To learn or to improve skills surrounding cursive handwriting, one needs to practice the letterforms. To produce these letterforms we need to build muscle memory, and the best way to do this is using repetition. The standard method of repetition is to repeat the same letterform over and over again—for example repeating a page of A's and B's and so on. This method of learning, although useful, has the potential to lose the interest of the learner. By using multiple sensory activities and project-based learning, one can be motivated to complete, the otherwise mundane act of repetition. Practice and repetition are necessary if one is seeking to improve skills when writing by hand. There are many areas, both digital and non-digital, that can be explored to improve the process of handwriting practice. No matter what the activity, if the focus is on learning the movement and the strokes of the letterforms, we can start to play and experiment with a range of different techniques. Emerging technologies using creative apps in virtual reality are an exciting development. There is something engaging about writing with ink-filled nibs across paper fibres, then switching over to virtual reality and writing the same letters on a much larger scale.

9:50 The Real Thing: An Aesthetic Comparison of Modelled Versus Traditional Guitar Amplification Technology in the Studio

Rob Keko & Ross McLennan

Since the rising popularity and widespread commercial use of the electric guitar in the 1950's, advances in guitar amplifier design and technology have played a key role in shaping the soundscape, tonal characteristics, recording methods and production styles of contemporary music. In recent years, digital modelling techniques have created

new ways of producing sought after guitar amplifier sounds, which have changed the way producers, artists and guitar players use this technology both in the recording studio and in live performance. This in turn has impacted on how listeners, concert attendees and music consumers hear and experience recordings and live music. Extensive comparisons between authentic and modelled amplification have been conducted in industry magazines.

However, these tend to be simplistic or overtly commercial in nature with typical yes/no style responses. A more rigorous approach is required which ascertains both gut feeling, as well as a more considered aesthetic response to the two technologies. This paper, therefore, presents a comparative study between traditional and modelled guitar technology that contextualises these amplifier sounds within fully produced music. It presents a non-biased quantitative and qualitative study of audience reaction to music – recorded using Apple's Logic Pro X software – which includes both amplification styles: authentic and modelled. The paper concludes with the results of the study and reflects upon the future of guitar amplification.

10:15 Conceptualising Game Design – A Tangible approach to Level Design

Henry Sun & Justin Carter

Conceptualising and communicating game design ideas amongst teams of game developers can be an enigmatic process. Designers of video games often rely on rapid prototyping and iterative approaches to creating game play experiences. Deep and meaningful experiences are not always easily expressed in the form of words and as a result, initial design intentions are often misinterpreted and or poorly communicated. This often leads to designers of games relying on a serendipitous approaches as they intrinsically move toward design intentions. These approaches are largely derived from traditional models of agile software development placing little emphasis on the cognitive process of individuals in the development team. Therefore, approaches based in theories of cognition are rarely considered for designers of games. One such area of this field is tangible design which attempts to investigate links between cognitive science and the physical tactile world. The impact that tangible approaches have on collaborative game design is yet to be thoroughly investigated.

This paper describes a practice-led study that aims to test the influence of tactile 3D printed video game assets on cognitive processes and design communication for teams when conceptualising game designs. This is achieved through a review of existing literature in the field, followed by an in depth analyses of a tangible approach to game level design. Through this process the study presents a deeper understanding of the implications that tangible design strategies have on conceptualising and communicating game designs.

10:40 Performance Capture: Split between the Fictitious and Physical World

Joel Bennett & Chris Carter

Performance Capture (PCap) is the process of capturing a continuous recording of an actor's movements and emotions using motion capture technology, typically in a 3D virtual world. This presents a somewhat unique situation for the actor in that they are challenged to imagine their virtual counterparts and a completely abstract, computer-generated world whilst delivering their performance. Central to this paper is the identification of the various implications that affect the actor's abilities during a performance by investigating professionals' experiences when using performance capture and through the exploration of the implications of performance capture in the creation of a short experimental animation.

1:00 Thursday - S02 Webb Centre, Room 4.02E

1:00 Early Development of a Flexible Procedural Approach to Automatic Jazz Improvisation

Daniel Field

This paper describes early work on an approach to automatic improvisation in the jazz idiom, derived from analysis of human practice, with algorithm development in the Jython Environment for Music (JEM). From the outset this project sought to be inspired by the human process of jazz improvisation and to apply as directly as possible the logic and processes of a human engaged in the activity of jazz improvisation – without necessarily using any specific computing technique or algorithm class. This paper describes the thinking and early experimentation

leading to the current prototype version which improvises essentially in real-time and demonstrates how the use of variable parameters can greatly increase the flexibility of procedural programming.

1:25 Crafting Environment Narrative: Investigating Environmental Storytelling use in Video Game Narrative

Blair Findlay & Justin Carter

Environmental storytelling has become a useful tool in game design as it can be employed in different ways depending on the designer's needs. The use of these techniques while documented aren't described clearly for a designer to easily incorporate into their game designs. This paper explores environmental storytelling and its utilisation in games with the knowledge translated into the design and creation of principles to serve as the means of answering the needs of beginning designers.

1:50 An Autonomous Music Composer based on Affective Principles

Jacob Olander

Over the past 60 years, there has been much research into the field of algorithmic composition. Techniques have been refined, and processes developed to suit a variety of needs. Recently however, focus has been turned to algorithmic composition for more emotive purposes. Affective Algorithmic Composition (AAC), the product of this research is a rapidly developing field, with many potential applications. In particular, AAC has the potential to solve one of the most prevalent issues in game audio. This research described in this paper covers the implementation of an Affective Algorithmic Composition system into a computer game. The methodology used is based upon Design Science Principles and is has a pragmatist theoretical perspective. Using Lindenmayer Systems and Markov chain theory, a fully functional system will be developed.

2:15 Visual Representation – Examining Level of Abstraction and Game Play Sensation

Stevie Mills & Justin Carter

Visual representation for video games describes the way in which objects are displayed in order to convey meaning and recognition for the player. As a component of the games metaphor, visual representation offers context for interaction and provides players with meaning for their actions. A key component of visual representation is how closely the representation resembles real objects. If the representation establishes full resemblance it is considered realistic. However, if it does not attempt to resemble or provide meaning for the object it is considered abstract. Early generation game systems provided low fidelity graphical capabilities and therefore designers were restricted in the level of realism that could be achieved. With the introduction of each new generation of game systems, capability to achieve more realistic fidelity in representations has increased expanding the spectrum of possibility between real and abstract. This notion of varying levels of abstraction linked to interaction has implications for designers of video games attempting to achieve specific gameplay sensations. Tensions arise for player sensation when the level of abstraction fails to the match the player's expected preconception of the game's play mechanics, creating a dissonance between player and the game play experience.

This paper outlines the results of a practice-led study examining visual representation as a component of game design. This is achieved through the development of a prototype that provides opportunity to explore varying levels of abstraction within specific rule based contexts. The study illuminates links between how meaning is conveyed visually to a player and the implications this has for game play sensation.

2:40 Plugins, Presets and Practice: The Impact of Digital Technologies on Contemporary Music Production Processes and the Music Industry

Andy Aubun & Ross McLennan

Mobile devices have not only changed the way we purchase and listen to music, but are changing the way song writers, composers and producers create. Mobile applications and laptop computers allow composers the freedom to make music anywhere, implementing a myriad of music making apps, software programs and plug-ins designed to simplify and, therefore, democratise music creation. The previously vast and complex arts of music composition and production are now accessible to everyone and accordingly, traditional methods of music composition and production are no longer standard practice. This paper explores these new standard methods of composition and production through the creation of a commercial song. Using iPhone applications for conceptualising and refining the song, computer-based methods for recording and production using a Macbook Pro laptop, and the Internet for automated mastering, this paper illuminates and catalogues a new standard in creative practice, and redefines traditional roles such as music composer, music producer and sound engineer.

3:30 Thursday - S02 Webb Centre, Room 4.02E

3:30 Generating a Virtual Forest Environment Using Procedural Content Generation

Liam Potter & Reza Ryan

Video game worlds are growing rapidly, creating a large amount of content that digital artists need to produce. To cope with this amount of content, game development companies would have to hire more artists and content creators, which is not economical. Therefore, Procedural content generation (PCG) techniques have quickly become a key area in the development of video game worlds. These techniques can be applied to generate a wide variety of things, from entire forests to the individual leaves on a tree. Simulated real-time virtual forests are one of the more common and complex virtual environments in contemporary video games that have to be generated procedurally.

In this research, we developed a system that integrates different PCG techniques to automatically generate and simulate a virtual forest in real-time. These techniques include Height Generation, Terrain Texture Generation, Detail Generation, Point Generation, Shadow Map Generation, Life Cycle Simulation and Day/Night Simulation. The implemented day/night system accurately calculate angle of the sun through the time of day to simulate life cycles

of all flora in the environment in real-time. The optimized developed system can be easily integrated with any real-time game that requires a forest environment.

3:55 Exploring the Craft of Immersion in Virtual Reality

Shanice Hayes & Justin Carter

Virtual reality (VR) systems are increasingly utilised as a medium in which to experience video games. These systems incorporate technology that is designed to offer the user an experience of a simulated physical presence within a virtual environment. The acceptance of VR as a platform for gaming has given rise to many new challenges for designers of games. These new challenges represent a disruption in the craft of game design on a scale not experienced since the transition from 2D to 3D graphics. This paper offers insight into the challenges for designers of VR games through the examination of existing strategies and design principles. These principles are then applied in the construction of a creative work that further expounds techniques for practitioners creating VR games.

4:20 Approaches to Modular Construction for Real-Time Game Environments

Braiden Fenech & Justin Carter

Video Game design and development has evolved into a profitable and widely accepted creative field that operates within ever-increasing technical capability. This improved capability has facilitated an increase in the visual fidelity achievable within real-time environments. Game artists faced with creating these environments are tasked with

maximising both system resource allocation and efficiency in production time. One strategy that has been adopted by artists is to implement a modular design and construction approach when developing environmental elements. Although this approach offers many benefits for artists, the associated skills and techniques are not well defined.

Through an exploration of existing literature and reflection on current practice, this study identifies and evaluates a range of contemporary approaches to modular construction for real-time environments and in the process offers valuable insight for practitioners.

2:00 Friday - S02 Webb Centre, Room 4.02E

2:00 Capturing Willandra – Challenges & Experiences Bringing a Hidden Historical Site to Interactive Digital Life

Chris Little & Dale Patterson

The Willandra trackways are one of Australia's most important historical sites. They include the footprints of our earliest Australians, some 20,000 years old, and all captured in the clay-pans of the Willandra lakes region. Unfortunately these national treasures are hidden, for their own protection, beneath a layer of sand and thus are completely unavailable to the broader public. This paper discusses the challenges in using digital capture techniques to capture and convert this data into interactive experience.

2:25 Unreal Realities: Non-Photorealistic Rendering in Virtual Reality

Peter Mills & Justin Carter

Virtual Reality (VR) is a rapidly growing field, disrupting many industries, such as video games, engineering, architecture, and medical visualization. Designing VR experiences involves the use of digital technology and rendered 3D graphics to create immersive virtual environments. While traditional user interfaces require users to view and interact with a screen, VR places the user inside a virtual environment through the use of a head mounted display (HMD). This form of user interface has implications on how rendered graphics are perceived and interpreted. One rendering technique used extensively in design and construction of virtual environments is Non-Photorealistic Rendering (NPR). NPR is primarily concerned with providing opportunity for a wide variety of expressive rendering styles such as toon, hatching and outline shaders.

This paper examines Non-Photorealistic Rendering techniques for virtual reality experiences, specifically focusing on strategies applied to achieve characteristics of toon, hatching and outline shaders, in virtual reality contexts. Through first identifying the common features traditionally used for NPR and then reconstructing these features in a virtual reality context the project illuminates unique considerations for practitioners implementing NPR effects in VR.

2:50 Design and Production of a Customisable 3D Character Pipeline

Matt McRae & Reza Ryan

One of the major barriers in creating a customisable 3D character is the lack of knowledge into the creative and technical pipeline required. Most games that have these kinds of systems are high budget games, with the artists and programmers having lifetimes worth of experience. These systems are also highly valued, and as such are often proprietary in nature, which means very little information on the actual construction is readily available. This research project aims to design a pipeline for creating a base character mesh tor single mesh to be used in a character creation system.

Presentations Track

Augmented Reality in Education – A Brief History

Stephen Atherton, Bond University

In 2016 "Pokemon Go" not only grabbed the attention of the public and the press – it injected a new life into a mature yet quickly evolving technology. In June this year Apple's ARkit was released and it has hit the reset buton by empowered developers to head in new directions and do so with a minimum of development effort.

This session will look at the evolution of AR by showing examples of work that has been done in multiple disciplines from various universities. The talk will review the scholarly literature and examine the efficacy of AR as a teaching tool and should offer a basic background for the more in depth and technical AR presentations and workshops at the conference.

Using Virtual Manipulative (VM) Apps to Build Basic Circuit-building Procedural and Conceptual Knowledge in Young Children

Garry Falloon, Macquarie University

The use of virtual manipulatives (VMs) has been relatively commonplace in mathematics education for many years, yet their use for science learning has been less frequent, and generally limited to virtual laboratories or simulations used to support specific investigations or experiments, or 'make visible' to students difficult to grasp or experience scientific phenomena. However, with the advent of low cost mobile devices and an array of science-focused apps, there is an opportunity to leverage the potential of VMs to introduce students to abstract and practical science ideas at a younger age.

This presentation outlines stage 1 of a study undertaken with new entrant children (5 year olds) in New Zealand, where a range of VM apps were used to introduce simple electrical circuit-building procedures and electricity concepts. Stage 2 of the project investigated whether or not the children could transfer any knowledge developed using the VMs into practical circuit building tasks using real equipment.

The teaching component of the study followed a guided discovery approach that provided minimal initial teacher direction. 'Can You?' circuit-building challenges were used to introduce different circuit types and concepts, and engage the children in each of the five, 40-minute teaching and research sessions. Empirical data were collected using an iPad display recorder app, and analysed for evidence of procedure and concept knowledge-building related to circuit construction, the function of circuit components, and 'what happens' in a circuit (ie., current flow, resistance etc.).

This presentation will share outcomes from stage 1 of the study, that suggests VM apps may provide teachers with a useful resource to build basic electricity concepts in early years education. It will present and discuss illustrative data highlighting how the students used the VMs to build understanding of different circuit designs and components, and how current was controlled.

Mobile Listening: Augmenting Environments and Connecting Communities with Sound

Dr Leah Barclay, Queensland Conservatorium Research Centre, Griffith University

See the Performance notes on page 9.

9:30 Friday - S02 Webb Centre, Room 4.02F

State of the AR

Iain Anderson, Training Brisbane

Apple's new ARKit has launched to some fanfare with iOS 11, and some flashy demos are already available. But is Augmented Reality just another fad? In this presentation, gain a broad overview of what AR is, of what developers have done so far with AR in gaming, education and art, and what it's likely to be used for next.

Attend if you've heard of AR but not really seen it in person, or if you're on the hunt for how you could potentially use AR in your own classrooms.

10:15 Friday - S02 Webb Centre, Room 4.02F

Mix Your World with Holograms

Thomas Verbeek, 8i Limited

Holo is an augmented reality app that brings realistic, 3D holograms to the masses. It allows users to manipulate volumetric media on their mobile devices using state-of-the-art rendering technology by 8i. Enabling this experience naturally comes with a lot of challenges, ranging from mobile device resource restrictions to explorations in user experience to being ready on the App Store for the worldwide release of ARKit.

This presentation explores some of the challenges we encountered and overcame during the development and release of Holo for iOS. We discuss some of the early assumptions and opportunities that guided the product to its initial release; evaluate design challenges regarding discoverability and interaction; provide an under-the-hood look at how we incorporated ARKit into Holo; and shed insight into the future of 8i's technology.

1:00 Friday - S02 Webb Centre, Room 4.02F

360° Photos and Videos – Fad or Future?

Iain Anderson, Training Brisbane

Today's 360° photo and video techniques let you capture the whole world around you, and today's VR goggles and smartphones let you see whatever part of the world you want to look at. This presentation will show you some basic techniques on how to capture and edit photos and videos in 360° formats, and how to distribute them to a wide audience. We'll use cheap cameras and widely available software, and you can make your own call on whether this is the way of the future or another fad.

Workshops

Unity and ARKit

Scott Roberts

ARKit is set to be available for 400 million iOS devices this year, making it the largest immersive technology platform in the world. We've seen a multitude of examples demonstrating how ARKit is helping developers create some impressive augmented reality apps, from virtual tape measures and navigation to fun things like games. It's now time we see creatives from all disciplines employing the technology to blend virtual environments with real ones. This workshop will explore the pathway to get you set up with ARKit in Unity, including plane detection, raycasting, and hit testing. Begin your immersive explorations with a taste of AR in Unity.

Teaching Coding on the iPad

Jonathan Sagorin

Are you facing the choice of how to teach or support coding on the iPad, and don't know where to get started? Or are you just interested yourself, and want to learn more? This workshop is for you! We'll cover three popular offerings: Swift Playgrounds (from Apple), Codea (from Adelaide-based Two Lives Left), and Pythonista (from OMZ Software).

We'll evaluate each app using the same selection framework, which you can use to choose any eduction app appropriate to your needs. We'll look into main features of each, getting started with simple coding, how to get additional content and share code with others, and where to find the best support resources.

Note: this is a hands-on **three-hour** workshop which requires that you bring an iPad along with you, running iOS 10.3 or iOS 11. All apps are available from the iOS App Store, and we encourage you to install them ahead of the conference to save time. Note that the combined size of all three downloads is around 900 megabytes.

Adobe Draw + Capture

Adobe Staff

Draw puts your favorite vector drawing tools and features into a simple, modern interface so it's easy to turn any idea or inspiration into a gorgeous design. You can even launch Adobe Capture CC from within the app, create a new shape, and have it immediately appear on your Draw canvas.

Adobe Premiere Clip

Adobe Staff

Turn the clips you shoot with your Android or iOS device into videos that look and sound incredible. Then share them on your favorite social channels, or sync them to Adobe Creative Cloud to take them further in Premiere Pro CC.

3:30 Thursday - S02 Webb Centre, Room 3.07 Mac Lab

Adobe XD

Adobe Staff

Go from concept to prototype faster with Adobe XD, the all-in-one UX/UI solution for designing websites, mobile apps, and more. With smooth, powerful performance, it's easy to deliver experiences that work and feel as good as they look on any screen.

9:00 Friday - S02 Webb Centre, Room 4.02C

TouchDesigner; Audio-reactive Visuals for Performance

Jason Haggerty

Join Jason in creating audio-reactive visuals and a custom made control-panel in the procedural programming platform, TouchDesigner. Perfect for artists, developers, and all kinds of tinkerers, TouchDesigner allows for very flexible programming from user-interfaces and complex real-time geometry, to data visualisation and interactive environments.

1:00 Friday - S02 Webb Centre, 4.02E

Wayfinding in Playable Cities

Troy Innocent, Swinburne University of Technology

Cities can be sites for self-discovery and transformation; they are also constantly in the process of becoming. Urban codemaking is a framework for decoding and reimagining cities, a programming language for urban space that marks locations in the city using codes enabling multiple alternate readings of that city – by machines, humans, and other entities.

This workshop will invite feedback on the current iteration of this system following a series of interventions into public space situated around experimental and playful approaches to wayfinding using urban codes.

For the best experience with this workshop, you should bring along an iPad running iOS 11.

1:00 Friday - S02 Webb Centre, Room 3.13 PC Lab

Adobe Character Animator

Adobe Staff

Create a 2D character and make it come alive. Character Animator CC copies your facial movements so your characters act — and react — realistically.

2:00 Friday - S02 Webb Centre, Room 3.13 PC Lab

Adobe Dimension

Adobe Staff

Adobe Dimension CC (formerly Project Felix) makes it easy for graphic designers to create high-quality, photorealistic 3D images. Composite 2D and 3D assets to build product shots, scene visualizations, and abstract art.

General Information

Registration Desk

The registration desk will be based near the entrance to S05 QCA Lecture Theatre on the opening morning of the conference, and will relocate to S02 Webb Centre, Room 4.05A for the remainder of the conference.

Meals & Refreshments

Start-of-day refreshments, **lunch and afternoon tea each day** will be served in S03 (Webb Centre) on level 4, in room 4.05B.

The **conference dinner** will be held on Thursday night at the Ship Inn, a short walk from the S07 (The Graduate Centre). Spaces are limited to people who indicated they would be attending at the time of registration.

Caterers have been provided with special dietary requirements as specified by delegates at registration time. Please understand that it may be impossible for caterers to address any special requirements not notified at least 7 days in advance of the event.

Please note that QCafé in the Grey St. Studios building is privately owned and operated, and not part of the catering for CreateWorld. You are welcome to purchase food and beverages at your own cost.

Internet Access

Wireless internet access is available and access details will be provided at registration time. If you are from an institution that supports **Eduroam**, you can use your originating institution credentials to connect.

Emergency Contacts

QCA Campus Security - dial 7777 (from internal telephones) or call 3735 6226.

For all emergencies, call triple zero, 000 or 112. Most mobile phones will call 000 (for Emergency Services) even when no credit is on the SIM card.

Conference Contacts

Tony Gray - 0432 018 441
Daniel Della-Bosca - 0419 735 095
Seth Ellis - 0490 220 740

Partners

We couldn't host CreateWorld without the generous support of a number of people and businesses.

We extend our thanks to Dr. Tim Kitchen and the team from Adobe for their support and for running workshops on Adobe's latest Creative Cloud products.

Thanks to the extraordinary team from The Queensland College of Art (QCA), a specialist arts and design college founded in 1881, and the oldest arts institution in Australia. The South Bank facility comprises public exhibition spaces, a cinema, conference rooms, a multimedia art gallery and the most modern and versatile studio facilities in Australia.

And thanks to Griffith University, our long term event partner. Griffith University was created to be a different kind of university—challenging conventions, responding to trends and pioneering solutions. Ranking in the top three per cent of universities worldwide, its future-focused degrees are developed in consultation with industry, based on cutting-edge research, and taught by Australia's most awarded teachers.

Conference Chairs

Daniel Della-Bosca is a lecturer in fine art, design and interactive media at the Queensland College of Art, Griffith University. He has worked and exhibited nationally and internationally as a designer and artist and is committed to the advancement of art and design education. Daniel's primary research focus is the application of fractal mathematics to the field of aesthetics, and his specific skillsets are the interdisciplinary bridges between art, design, CAD software and algorithmic generation of image and form. Daniel has a portfolio that spans public sculpture, exhibit design, jewellery and animation, all for the purpose of engaging in visual and haptic discourse.

Seth Ellis is senior lecturer in interactive media program at the Queensland College of Art, Griffith University, where he is program director of the Bachelor in Creative and Interactive Media. He is a narrative artist and interface designer; his work draws upon local history, allegorical narrative, and experience design to create stories both historical and fictional in new, experiential forms. Seth as worked with local museums and galleries on their collections and exhibitions; his own projects have shown in galleries, streets, symposia and festivals throughout the U.S. and Europe, and at a few places in the Atlantic Ocean.

Dr. Dale Patterson is a computer scientist and lecturer in Digital Design, Visualization and Interaction. Dale has worked in the field of computer science both commercially, in education and research for more than 20 years (focusing on 3D computer graphics and its applications). Dale's primary areas of interest include human computer interface design, VR & AR, 3D computer animation, visual effects and games. Dale also has strong research interests in computing as applied in bio-medical applications (e.g., scientific visualization, applied games & learning, artificial intelligence).

Tony Gray has been Chair of the AUC since late 2010. He is a software developer and educator with over 25 years of experience providing IT support in the University sector, and is co-chair of the AUC's other two conferences–/dev/world for software developers and X World for system administrators. Tony also writes for O'Reilly Media on the Swift programming language.

About the AUC

The AUC was established towards the end of 1984 as a partnership between Apple Computer and nine Australian universities.

At the heart of the relationship was the ability for departments, staff and students to obtain Apple technology at reduced prices and to enable the development of innovative solutions using the Macintosh. The AUC grew to form a network of educational technologists across the universities of Australia and New Zealand, growing to 37 member universities by 2012.

The history of the AUC is one of adapting to change, and in 2013 we reinvented ourselves as a not-for-profit association with no formal relationship with Apple. Our mission is to support and build communities around the use of Apple technologies by sharing experience, insights and know-how amongst members, developing people as leaders, and inspiring and fostering innovative use of technology.

Each year, we hold three conference events for specific subsets of our community. **X World** is for system administrators and support staff, **CreateWorld** is for performance artists, teachers, and those working in the creative spaces, and **/dev/world** is for software developers. Our conferences are open to all.

Learn more, including how to become a member, at www.auc.edu.au.