

GameSoundCon 2016 Agenda

Tuesday September 27

	Game Audio Essentials Emerald	Game Audio Pro Heinsbergen	Virtual Reality Audio Corinthian	FMOD Cordoban	Wwise Roman
7:30 -	Registration				
9:00 - 9:15	Welcome and Introduction				
9:25 – 10:25	<i>Introduction to Game Audio (Brian Schmidt)</i>	<i>The Music and Sound of Gathering Sky (Dren McDonald)</i>	<i>VR Audio Workflow (Chris Hegstrom, Jesse Holt)</i>	<i>Interactive Audio Prototyping with FMOD Studio and Unity. (Liam de Koster Kjaer)</i>	<i>Interactive Music (Part 1) - Understanding the Process From Composition to Game Play (Robert Brock)</i>
10:35 – 11:35	<i>Essential Game Audio Tech I (Brian Schmidt)</i>	<i>Runtime Sound Design is Funtime Sound Design (Jaclyn Shumate)</i>	<i>Beyond 360: Advanced Audio Techniques for VR Scott Gershin, Viktor Phoenix)</i>	<i>Mixing and Debugging the Audio without the Game(Liam de Koster Kjaer)</i>	<i>Interactive Music (Part 2) - Exploring Interactive Music Structures and Strategies (Simon Ashby)</i>
11:35 – 12:00	<i>Break</i>				
12:00 – 1:00	<i>Interactive Composition Part I (Paul Lipson)</i>	<i>VO: Evolving Techniques and Practices (Chip Beaman, Randy Coppinger, Kevin McMullan, Morla Gorrondona, Michael Csurics)</i>	<i>Creating Music for “Edge of Nowhere” (Michael Bross)</i> <i>Lessons from the Audio of “Job Simulator” (Daniel Perry)</i>	<i>Advanced Sound Design Techniques (Kevin Regamey)</i>	<i>Introduction to Wwise (Part 1): Hands-on Quick Start to Game Sound Integration(Robert Brock)</i>
1:00 – 2:45	Break (1:45) RoundTable: Women in Game Audio (Athenian)				
2:45 – 3:45	<i>Interactive Composition Part II (Paul Lipson)</i>	<i>Sound Design for League of Legends (Adam Swanson, Brad Beaumont)</i>	<i>Creating Immersive and Aesthetic Auditory Spaces for VR and AR (Chanel Summers)</i>	<i>Mixing and mastering your game in real-time (Kevin Regamey)</i>	<i>Introduction to Wwise (Part 2): Game Play Simulation and Mixing / Performance Monitoring and Optimization(Robert Brock)</i>
4:00 – 5:00	<i>Crossing the Streams (Scott Selfon)</i>	<i>Panel: YouTube, Music, Video Games and ...Money (Jim Charne, Jeremy Lin, Noah Becker, Jody Friedman Brian Schmidt Moderator)</i>	<i>I’ve been working in VR Audio All Year and all I’ve got to Show for it is “Headset Hair” (Sally Kellaway, Bonnie Bogovich, Daniel Perry, Varun Nair)</i>	<i>Adaptive music with Gordon Ramsay Dash (Dren McDonald)</i>	<i>Introduction to Wwise (Part 3): Interactive Music - Hands On from Composition to Gameplay(Robert Brock)</i>
5:00 – 5:30	Break				
5:30 – 6:30	Gordy Haab: The Music of Star Wars:Battlefront (Emerald)				
6:30 – 9:00	Networking Mixer (Gold)				

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Wednesday September 28

	Game Audio Essentials Emerald	Game Audio Pro Heinsbergen	Game Audio Research Corinthian	FMOD Cordoban	Wwise Roman
9:30 - 10:30	<i>Essential Game Audio Tech II (Brian Schmidt)</i>	<i>The Music of Killer Instinct, Season 3 (Tom Salta, Klayton (Celldweller))</i>	Scalable Acceleration of Real-time Audio Processing Using Hardware-Partitioned GPU Compute Units (Carl Wakeland)	<i>Mixing and Debugging the Audio without the Game (Liam de Koster Kjaer)</i>	<i>Introduction to Wwise (Part 1): Hands-on Quick Start to Game Sound Integration (Robert Brock)</i>
			3ME – A 3D Musical Experience (Andrea Genovese, Charles Craig Jr., Juan Simon Calle, Agnieszka Roginska)		
10:30 – 11:00	<i>Break</i>				
11:00 – 12:00	<i>Integrating Game Audio With Unity (Steve Horiwitz, Scott Looney)</i>	<i>Beyond Wild Hunt: Musical Evolution of The Witcher Series (Marcin Przybytowicz)</i>	Investigating the Impact of Source Spectra on Spatialized Audio Content (Sally Kellaway)	<i>Advanced Sound Design Techniques (Kevin Regamey)</i>	<i>Introduction to Wwise (Part 2): Game Play Simulation and Mixing / Performance Monitoring and Optimization (Robert Brock)</i>
			Prototyping Tools for Interactive Music (Nick Venden)		
12:00 – 1:45	<i>Break</i> <i>(12:45) Game Audio Education Roundtable (Athenian)</i>				
1:45 – 2:45	<i>Game Audio Business Essentials: (Richard Ludlow)</i>	<i>From Seed to Superhero: A Plants vs Zombies Heros Post-mortem (Becky Allen, Luca Fusi)</i>	Audio-Visual Alchemy Procedural music generation for VR and games (Paul Hembree)	<i>Mixing and mastering your game in real-time (Kevin Regamey)</i>	<i>Dynamic Mixing Tools and Techniques Using Wwise (Simon Ashby)</i>
			Some Possibilities for Totalistic Cellular Automata in Generative Game Music (Isaac Schankler)		
2:45 – 3:15	<i>Break</i>				
3:15 – 4:15	<i>How to think like a Game Designer (Scott Looney)</i>	<i>Staying Power: How to have a Long, Thriving Career in Game Audio (Michael Bross, Stephan Schutze, Caron Weidner, Adam Gubman, Emily Reese Moderator)</i>	Wait, Where'd It Go? Realistic Representation of Moving Sound Sources in a Virtual Environment (Sam Hughes)	<i>Adaptive music with Gordon Ramsay Dash (Dren McDonald)</i>	<i>3D Audio Implementation with Wwise (Simon Ashby)</i>
			Spatial Audio Modelling used to provide Artificially Intelligent Characters with Realistic Sound Perception (Bill Kapralos)		
4:15 – 5:00	<i>Break & Giveaways (Emerald)</i>				
5:00 – 6:00	<i>Audio Director & Composer's Roundtable (Emerald)</i> <i>Paul Lipson, Russell Brower, Becky Allen, Sarah Schachner, Emily Reese (Moderator)</i>				

Session Descriptions

Game Audio Essentials

Day 1

Tuesday, September 27, 9:25 -10:25

Introduction to Game Audio: How Games are Different from Anything You've Worked on Before

(Brian Schmidt) This session provides an introduction and exploration into the many ways in which video game music and sound design are fundamentally different from linear media such as television or film. It also covers what to expect when working on a game, and how being part of a game team is very different from being hired to score or do sound design for more traditional media.

Tuesday, September 27, 10:35-11:35

Essential Game Audio Tech I

(Brian Schmidt)The technology behind game sound, both its capabilities and limitations can have a profound impact on how game sound is created and put into a video game. Knowing these gives the composer or sound designer the ability to set a high bar, but not promise more than they can deliver. This session will cover the essential issues in game audio technology and how they affect what is and isn't possible when creating game sound and music. Digital Audio, Game Sound Compression, Inside a Game Console, How Console Technology Affects Game Music & Sound Design are some of the topics covered.

Tuesday, September 27, 12:10-1:10

Composing Interactive Music I

(Paul Lipson) This session will follow the creation and implementation of an interactive musical score for a major console game. Beginning with how to work with the designer to map game levels to music, the session will focus on the interaction between what's technically possible and the composer's vision for the game, through the planning, recording and production phases.

Tuesday, September 27, 2:45-3:45

Composing Interactive Music II

(Paul Lipson)This session continues the creation and implementation of an interactive musical score for a major console game. In part II, the emphasis will be on the creative aspects of the composition process for games from managing key signatures, tempos and themes to orchestration and production techniques.

Tuesday, September 27, 4:00-5:00

Crossing the Streams: Game Audio Rule Breakers

(Scott Selfon) In the hectic world of game audio production, programming, and overall game development, it's easy for the audio creator's head to get buried in capturing and implementing the daunting spreadsheet of cues right in front of them. This talk challenges us to break free of audio as part of a "post-production" world. We'll highlight some of the unique and innovative audio developments of the past decade where the audio has turned around the equation, and instead been a key "pre-production" component, driving the implementation rather than the other way around. While some of the illustrations will be well known, others include tricks and tips not seen since their initial demonstrations, challenging us to continue to push on that fourth wall and provide sound that not only matches the visuals, but provides surprises to the user.

Tuesday, September 27, 5:30-6:30

The Music of Star Wars: Battlefront

Gordy Haab: Featured Talk (Emerald)

Session Descriptions

Game Audio Essentials

Day 2

Wednesday September 28, 9:30 - 10:30

Essential Game Audio Tech II

(Brian Schmidt) This session will cover more advanced topics in game audio technology. Covered topics include interactive Mixing, how run-time DSP is used in games, how 3D and Real-time Surround Sound are used and how Environmental Effects are applied to games as well as an introduction to Virtual Reality Audio and HRTF.

Wednesday September 28, 11:00 – 12:00

Integrating Game Audio with Unity

(Steve Horowitz, Scott Looney) Putting sound to picture in linear media such as film or TV is quite straightforward. Doing it for games---not so much. In this session, Steve and Scott will cover one method of putting game music and sound into the game itself using Unity, one of the most popular game development platforms.

Wednesday September 28, 1:45 - 2:45

Business Essentials: Pitches, Paperwork and People

(Richard Ludlow) In an ideal world most of us would prefer to just create Audio all day long. However the reality for many of us is that our time is consumed with the 3 essential business P's: Pitches, Paperwork, & People. In this talk Andy, Kole, & Richard will discuss networking strategies, finding the right project(s) for your skill set, developing a brilliant pitch, & sealing the deal with a mutually beneficial Agreement.

Wednesday September 28, 3:15 – 4:15

How to Think Like a Game Designer

(Scott Looney) In this talk, author, educator, and game audio guy Scott Looney will take you through a tour of different dilemmas and issues encountered in game audio which can be aided by understanding the demarcation and division between what he calls game logic and sound logic within the structure of the game itself. Solutions will be discussed and compared with a focus toward applying them generically using any available audio middleware, and understanding both the needs of the game design as well as the needs of the implementation designer in finding appropriate and efficient methods of triggering and controlling audio events. Being able to work well within the limitations of the game's design will be an increasingly essential and valuable skill to have in the field.

Wednesday September 28, 5:00 – 6:00

Audio Director's/Composer's Roundtable

(Paul Lipson, Becky Allen, Russel Brower, Sarah Schachner, Emily Reese: Moderator) The job of Game Audio Director requires a unique combination of technical, musical, creative and business skills. In this roundtable, some of the leading audio directors discuss their job on issues ranging from working with the publisher to hiring external composers and sound designers

Session Descriptions

Game Audio Pro

Day 1

Tuesday, September 27, 9:25 – 10:25

The Music and Sound of Gathering Sky

(Dren McDonald) A game with no words, no voice, and no tutorial needs to rely on something besides visuals to tell its story, and in Gathering Sky the audio was responsible for providing this narrative. Using FMOD Studio (and Java), Dren created a dynamic music system with loops, transitions, stingers, and musical sounds to help guide the players through this emotional experience. In this talk he will demonstrate many of the techniques he used, both in the middleware and in the music preparation and recording sessions to achieve a multi-award winning soundscape on an incredibly indie budget.

Tuesday, September 27, 10:35 - 11:35

Tales of Audio from the Third Dimension

(Jaclyn Shumate) At PopCap, I make sounds for mobile games by using Middleware as my DAW to create something from (almost) nothing. I use a combination of run-time synthesis, envelopes, LFOs, filters, tone generators, dsp, and a small, carefully created set of .wav assets to make great sounding games with minimal download size, CPU, and RAM use. These techniques can be heard on the GANG award winner Peggle Blast (iOS, Android, 2014) and the soon to be released Bejeweled Stars (iOS, Android).

In this talk, I'd like to walk the attendee through this process, including examples from both Peggle Blast and Bejeweled Stars. I will discuss techniques for using synthesis, tone generators, envelopes, and dsp to create and modify content. I will show the attendee through these examples the effects this has on the creative pallet, and how to make smart decisions to match the esthetic target of the game you are working on. I will show the workflow, including creating a real-time asset to picture, getting it from middleware into the game, and then the iteration pipeline. Lastly, I will show examples of how this leads to easily having procedural game audio as an option in your regular work-flow, and talk about the exciting future of real-time procedural audio.

Tuesday, September 27, 12:10 - 1:10

Video Game VO: Evolving Techniques and Practices

(William "Chip" Beaman (Formosa), Randy Coppinger (Disney), Kevin McMullan (Line In Audio), Morla Gorrondona (Independent), Michael Csurics (Brightskull)) With this panel we would like to introduce, and discuss, topics that are currently relevant to the VO side of Game Audio Development with a panel of leading industry experts from GVAC, the Game Audio Network Guild's (G.A.N.G.) professional voice wing. Planned topics include: Modern Recording and Performance Techniques (ensemble, p-cap, etc...), Working with Independent Studios, Localization, How VR impacts VO, and more.

Tuesday, September 27, 2:45 - 3:45

Sound Design of League of Legends

(Adam Swanson, Brad Beaumont, RIOT Games) Our talk will cover how we go about designing champion sound effects for League of Legends. As League of Legends has such a large selection of different character themes, creating iconic sound design that supports gameplay can be quite a challenge. We'll start off by walking you through our process from the start of exploration through to final polish. We'll talk about how we approach the feedback process, and some specific elements we feel help us continue to push the quality bar. The second half of our talk we will dig into a few specific champions and tear down their spells to show you how we created the sounds. We will discuss everything from the tools we used, how we get our sounds, our individual approaches and even some examples of what worked well and what didn't.

Tuesday, September 27, 4:00 – 5:00

Panel: YouTube, Music, Video Games and ... MOney

Noah Becker (CEO, AdRev), Jim Charne (Media Attorney), Garry Schyman (Composer), Brian Schmidt (Moderator). The advent of user videos on platforms like YouTube present a complex maze of rights, payments and copyright issues. This panel will attempt to shed some light on what the issues—both legal and practical—are regarding music in games on YouTube, from fan-generated covers to Let's Play videos.

Session Descriptions

Game Audio Pro

Day 2

Wednesday September 28, 9:30 – 10:30

The Music of Killer Instinct, Season 3.

(Tom Salta, Klayton/Celldweller) This talk will be a traditional postmortem discussion walking the audience through the music of Killer Instinct: Season 3. What makes this panel and soundtrack unique is that it brings together two established artists/producers...Tom Salta (aka Atlas Plug) and Klayton (aka Celldweller). The audience will definitely be engaged by these two dynamic speakers. (We also might have the audio director, Zach Quarles on the panel as well). KI Season 3 features highly interactive music (using Wwise) for eight distinctly different characters in a wide variety of styles, including Judge (the arbiter from Halo), Kim Wu (from the original KI), Tusk (with a live choir), Mira (with a full live orchestra and soloists) and others. We have already assembled a highly entertaining set of behind the scenes videos so you can get a sense of the content we plan to discuss. We will also get into the more technical aspects of how the music was assembled and integrated into Wwise.

Wednesday September 28, 11:00 – 12:00

Beyond Wild Hunt: Musical Evolution of the Witcher Series

(Marcin Przybytowicz) Music from The Witcher 3: Wild Hunt is one of the most praised video game soundtracks of 2015, thanks to it's original musical approach and mixture of Slavic folk with contemporary elements. This speech will take a closer look on how The Witcher's musical style was further developed on Wild Hunt's expansion packs Hearts of Stone and Blood and Wine , as well as on other games from Witcher universe. Lecture will cover analysis of both artistic and technical side of The Witcher soundtracks' creative process.

Through practical examples and anecdotes, attendees will be guided through all the steps, missteps and team effort that went into refreshing musical design of The Witcher series and get to know what kind of challenges may await for them while working on music for established franchise.

Wednesday September 28, 1:45 – 2:45

From Seed to Superhero: A Plants vs Zombies: Heroes Audio Post Mortem

(Becky Allen, Luca Fusi) Plants vs Zombies: Heroes is a collectible card game for iOS and Android developed by EA's PopCap studio. Its audio is the storied end product of two years work to evolve an aesthetic, breach a genre and--hopefully--bring a series core fanbase into a brave new sonic world that feels still feels familiar.

In this post-mortem, two of the PvZ:Heroes audio team will speak to lessons learned over the course of the game's development: how reinforcing player choice with custom music themes, sound and vocalizations for each Hero and all 300+ collectible cards in the deck: matching mix to player headspace through "emotionally mapped" parameters; sound design and composition techniques discovered while defining the new sound of PvZ; how to gather intra-team support for ambitious audio in a mobile dev environment; and doing it all in a title that'd fit comfortably onto the app store.

Wednesday September 28, 3:15 – 4:15

Staying Power: How to have a Long, Thriving Career in Game Audio

Sally Kellaway, Bonnie Bogovich, Daniel Perry , Stephan Schutze) In this session, we seek to explore topics relevant to contract audio developers composers and sound designers, VO and contract audio directors in an effort to demystify the process of professional development when you're on your own. We will highlight the differences between working in and out of house, while offering suggestions, strategies, and anecdotes from our own work experience that will plant the seeds for attendees to cultivate their own booming entrepreneurial selves. Topics will be divided into several sides of the 'audio entrepreneur self'.

Social entrepreneur we will demonstrate a few different networking styles, discussing what has and hasn't worked for us, and why it can take so long to build a steady client base. The social side will also include how to trace trends in social networks that might lead to business opportunity.

Professional entrepreneur we will discuss the differences between the career ladder in and out of house, how your current project will influence your next move, and how to understand the market needs vs what you have to offer. We will also touch on how to track financial trends in games in order to determine where to look for your next gig.

Life entrepreneur this will cover some regular 'life lessons' that touch on self development, in both the creative and technical sides of audio, while nurturing your uniqueness in order to help you find your own voice and marketing angle. We will also discuss family balance, friends and familial sacrifice, and how to avoid burnout.

Audio for Virtual Reality (Corinthian: Day 1)

Tuesday, September 27, 9:25 -10:25

VR Audio Workflow (Chris Hegstrom, Jesse Holt) Everyone is excited about VR audio & all of the potential new opportunities but what do we need to do to get there? What will the VR audio workflow look like in 5 years time when we're more confident & comfortable with this new medium? Wwise & FMOD are the standards for game audio today, yet they weren't created in one day. What elements from games, film, live & broadcast can we cherry pick for VR audio & what from those fields will we need to relearn?

VR audio requires a new point of view for recording, designing, integrating, monitoring & mixing 3D sounds. Being able to envision & discuss this workflow will help us arrive at it sooner & start creating & experiencing sonic VR content the way it was meant to be.

Tuesday, September 27, 10:35-11:35

Beyond 360: Advanced Audio Techniques for Virtual Reality (Scott Gershin, Viktor Phoenix) The consumer VR market exploded this year and, with that growth, brought a renewed focus on audio. Developers and storytellers working in VR are now looking to sound designers to help them realize their visions with 3D audio. Making the transition from traditional 360 positional sound to more advanced uses of 3D sound brings exciting potential with it, but can create some creative and technical challenges as well. While there is plenty of available information on 3D audio, it is mostly academic with very little practical insight. Technicolor's Scott Martin Gershin and Viktor Phoenix draw on their experience to share creative techniques, discuss technical tools and review best practices for designing, implementing & mixing 3D audio for VR. The information will be presented in an approachable, yet thorough, presentation that will inspire and inform.

Tuesday, September 27, 12:00 – 12:35

Creating Music for the VR-driven "Edge of Nowhere" (Michael Bross) Composer Michael Bross will discuss his work on Insomniac Games's "Edge of Nowhere", a third-person action-adventure game published on the Oculus Rift and due for release in June 2016. Michael will walk through his process of composing for this special title and gives a post-mortem along the way while discussing the 6-month timeline, from early music sketches to the final hours of production. Involving intense music "design" and a 55-piece orchestra for the 2-hour long music score, he will present creative approach, insightful music examples, challenges encountered with the title and also VR, and provide a behind-the-scenes view of Wwise implementation.

Tuesday, September 27, 12:40 – 1:10

How to Job—Lessons from the Audio of the VR Game, "Job Simulator" (Daniel Perry) Through the development of Job Simulator, the premiere VR launch title for HTC Vive as well as Oculus Touch and PlayStation VR, I stumbled upon a lot of situations that have not been seen in any other form of interactive gaming. I will talk about how the concept of ambience in VR has changed, and how it affected the decision making of audio placement in Job Simulator. I will talk about hand interaction with objects, and the importance being able to interact with every single object in VR, and and insight into the design of a specialized audio impact tool within Unity was created, and how we approached the unique challenge of draggable objects such as drawers and sliding doors.

Tuesday, September 27, 2:45 – 3:45

Creating Immersive & Aesthetic Auditory Spaces for Virtual and Augmented Reality (Chanel Summers) Every year more complex interfaces and completely new forms of experiences emerge that we audio designers are called upon to master, each with its own brand new complications when it comes to creating immersive, compelling audio designs. But with wearable interfaces and head-mounted displays becoming more commonplace, it will be important to cultivate the skills to create quality audio that not only meshes seamlessly with the world and experience that is being created, but also does so in an artistic way that furthers the design goals of the game. This presentation will discuss the challenges and specific solutions for creating audio for interactive virtual and augmented reality experiences. It will reveal audio techniques that can be used today to advance storytelling and gameplay in virtual environments while creating a cohesive sense of place. And it will demonstrate processes and techniques used in shipping products to construct the audio for everything from immersive mixed reality experiences to multiparticipant, multi-site location-based games.

Tuesday, September 27, 4:00-5:00

I've been working in VR Audio all year and all I've got to show for it is Headset Hair (Sally Kellaway, Bonnie Bogovich, Daniel Perry, Varun Nair) In the hectic world of game audio production, programming, and overall game development, it's easy for the audio creator's head to get buried in capturing and implementing the daunting spreadsheet of cues right in front of them. This talk challenges us to break free of audio as part of a "post-production" world. We'll highlight some of the unique and innovative audio developments of the past decade where the audio has turned around the equation, and instead been a key "pre-production" component, driving the implementation rather than the other way around. While some of the illustrations will be well known, others include tricks and tips not seen since their initial demonstrations, challenging us to continue to push on that fourth wall and provide sound that not only matches the visuals, but provides surprises to the user.

Academic/Research (Corinthian: Day 2)

Wednesday, September 28, 9:30 -10:00

Scalable Acceleration of Real-time Audio Processing Using Hardware-Partitioned GPU Compute Units (Carl Wakeland) Although GPUs possess an immense theoretical computing capacity that is very capable of enabling these new technologies, efforts to utilize this capacity for scalable, low-latency real-time audio within the context of an intensive game workload have fallen short of achieving reliable and predictable quality of service. These attempts have frequently met with unpredictable degradation to graphics performance and other critical functions running in the GPU. AMD TrueAudio Next is a technology that supports scalable, dynamically configurable, hardware-enforced partitioning of compute units within single or multiple GPUs, with a dedicated job submission queue. Test results will be presented that show how TrueAudio Next can allow intensive low-latency audio workloads such as time-varying convolution with a high channel count to co-exist on a GPU running an intensive VR gaming workload, with predictable performance for both audio and graphics. An audio convolution algorithm from the open-source TrueAudio Next library that provides high GPU utilization will be outlined as an example of a programming method that allows the GPU to process audio with buffer latency as low as 1.3 ms.

Wednesday, September 28, 10:05-10:35

3ME – A 3D Musical Experience (Andrea F. Genovese, Charles J.P. Craig Jr., Juan Simon Calle, Agnieszka Roginska) 3ME is a three dimensional musical experience for Virtual Reality, it combines binaurally recorded audio with 360° videos. The goal of this scholarly research is to enlighten game developers and attendees about the pivotal role sound plays in immersing users within a virtual environment. Differently from standard VR sound object simulation techniques, through the use of 3D soundfield capture and reproduction techniques and technologies, as well as complementary 360° videos, 3ME recreates the natural acoustic environments of concerts, events, and soundscape experiences. The user can enjoy these musical experiences from a first person perspective. This project centers around a discussion of Ambisonics and Binaural recording techniques used for the 3D sound capture system, giving an overview of the approach used to implement the recorded audio with the 360° video in Unity. Currently the VR implementation is set to work on Oculus Rift, making use of its head-tracking capabilities in syncing the movement of the audio and video with that of the user's head. The presentation is followed by a discussion on the motivations behind the use of the aforementioned technologies and formats. This presentation includes a VR demo of some of the 3ME recording sessions conducted by the NYU Immersive Audio Group.

Wednesday, September 28, 11:00 – 11:30

Investigating the Impact of Source Spectra on Spatialized Audio

Content (Sally-anne Kellaway) It is widely accepted that the ear imparts a filter on incoming sound signals in order to understand the position of a sound source in relation to the listener. The characterisation of this filter is the Head Related Transfer Function (HRTF), which has decades of research history investigating the impact of the various spectral elements on the human ability to localise sound. As audio professionals, we also understand that spectrums are able to be summed and manipulated in various ways that create new spectra. One way that this can manifest is with the summing of the spectra of source sound, HRTF spectra, and the delivery hardware.

The speaker reports on research findings that demonstrate evidence for this effect having a prevalent effect on delivery of HRTF processed audio in Virtual Audio Displays (VADs). This presentation will focus on the impact of source spectra on HRTF processing, as an example of these interactions. Investigating these impacts by referencing research conducted in laboratory conditions, we are able to extrapolate and discuss the potential impacts of this effect in industry. Attendees will leave this session with an understanding of the impact of elements of their pipeline on the effect of HRTF processing in their Virtual/Augmented and Mixed Reality projects, including source and delivery mediums.

Wednesday, September 28, 11:35 – 12:05

Adapting Computer Game Prototyping Tools for Interactive Music (Nick Venden) This talk explains how to adapt computer game prototyping tools as controls for interactive digital music. It focuses on tools for third order ambisonics including Blue Ripple Sound's Rapture3d for Unity, scripting methods for buffered streamed reading of audio, and demonstrations of how to do all this for the HTC Vive controllers. Secondly it explains how to use these same spatial audio scripting methods for narrative techniques. More importantly it shows how to make it fun, how to give game-player-listeners the ability to structure the music interactively and become the composers of their own game experience.

Wednesday, September 28, 1:45 – 2:15

Audiovisual Alchemy (Paul Hembree) Audiovisual Alchemy is a novel method of procedurally generating music and abstract animation with potential applications for virtual and augmented reality games. It was initially developed as an interactive, multi-modal environment for improvising audio-visual experiences within the context of concert music. Audiovisual Alchemy combines techniques and theories from procedural pattern generation, 3D audio, and musical cognitive science to viscerally induce the experience of the technological sublime in players and audience members.

Concerning specific techniques, cellular automata, which are frequently used for procedurally generating terrain in Rogue-like games, are used in Audiovisual Alchemy to activate an array of sound- and light-producing modules within an explorable, virtual 3D space. In essence, the cellular automata “play” the array of modules as if they were an instrument. The spatial arrangement of these modules affects the potential musical pitches available to the listener at any moment, through the use of 3D audio techniques. Utilizing musical cognitive science, various spatial arrangements of modules can be generated, enabling anything from consonant, traditional harmonies, to dissonant or even microtonal harmonies. The harmonic and melodic content produced by Audio-visual Alchemy is an emergent feature of three forces: the activity of the cellular automata, the spatial arrangement of modules, and the guidance of the user.

Wednesday, September 28, 2:20 – 2:50

Some Possibilities for Totalistic Cellular Automata in Generative Game Music (Isaac Schanlker) Elementary cellular automata have been successfully employed as devices for procedural generation in games, but their use in game audio has, up until now, been limited. One characteristic of elementary cellular automata is that they generate binary values (0 and 1). Totalistic cellular automata, by contrast, generate a range of values that can then be mapped onto a spectrum.

By showing how totalistic cellular automata can be used in various musical and sonic contexts, affecting dynamics, timbre, melody, harmony, and rhythm, I will demonstrate how totalistic cellular automata may be able to generate music with greater variety and expressivity than ordinarily found in generative music for games.

Wednesday, September 28, 3:15 – 3:45

Wait, Where’d It Go? Realistic Representation of Moving Sound Sources in a Virtual Environment (Sam Hughes) With new technologies in development and released, such as Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR), there is a limited amount of research conducted into the impact of content delivered on these mediums, especially with regards to audio. This research aims to identify the reasoning behind using binaural representation of audio when trying to recreate realistic auditory environments, as opposed to other delivery formats. Comparing binaural playback over headphones to multichannel audio delivery methods, this presentation explores the difference localising moving sound sources.

The focus of this presentation is to explore how localisation performance is affected by different playback mediums and how to realistically emulate moving sound sources in a virtual environment. With VR, AR and other new technologies becoming so easily available, it is important we understand the potential effects of our practise. This presentation will make use of both comparative research from other screen mediums, other VR research and experimentation conducted by the presenter. Attendees will gain an understanding of introductory research that currently explores the use of moving sound sources in virtual environments, and how this applies to their practise as audio professionals in the game audio industry. This understanding should allow attendees to make informed creative decisions to heighten or control the quality of their work appropriately and with knowledge of the impact of their work.

Wednesday, September 28, 3:50 – 4:20

Spatial Audio Modelling used to provide Artificially Intelligent Characters with Realistic Sound Perception (Brent Cowan, Bill Kapralos) Despite the advancements in artificial intelligence (AI) for video games and virtual environments, the non-player characters (NPCs) do not perceive the world in a realistic way. NPCs are often all knowing (omniscient), meaning that they know where the player(s) is at all times without having to perceive them using one or more of the five senses (hearing, sight, touch, smell, and taste). However, it is not possible for a NPC to realistically simulate human behaviour without limiting the NPC’s knowledge to what they could have perceived by way of their senses. This includes prior knowledge, current sensory input, as well as information received through some form of communication (other NPC, video surveillance, alarm ringing, etc.). Many video games feature some form of combat as their core game-play mechanic (player interaction with the game world), and the NPCs take on the role of enemy units attempting to converge on the player’s position. The NPC’s visual perception is often simulated by checking for line-of-sight between the NPC and the player’s avatar. Line-of-sight is calculated by casting a ray through the scene starting from the NPC’s head and pointing toward the player’s avatar. If the line between the NPC and player is unobstructed by obstacles in the environment, then the enemy unit has line-of-sight, and the player has been detected. The NPC’s sense of hearing is often ignored completely, or simply distance based, without taking the environment into account. To simulate the NPC’s sense of sight, it is important to test for visual occlusion (blocking caused by objects in the environment). Similarly, acoustical occlusion must also be approximated in order to simulate the NPC’s sense of hearing. Inspired by our previous work that saw the development of an acoustical occlusion method used to approximate occlusion/diffraction effects for dynamic and interactive virtual environments and games (Cowan and Kapralos, 2015), here we apply this method to NPCs giving them the ability to “perceive” sounds and therefore behave in a more natural, and realistic manner.

FMOD Sessions

Tuesday, September 27, 9:25 – 10:25

Interactive Audio Prototyping with FMOD Studio and Unity.

(Liam de Koster Kjaer)

Introduction to the FMOD Studio creative workflow. From asset discovery in FMOD.io to creating Events and game testing in a Unity based sandbox, Liam takes you step by step through the process and shows just how easy it is to bring your game audio ideas to life.

Tuesday, September 27, 10:35 - 11:35

Mixing and Debugging the Audio without the Game

(Liam de Koster Kjaer)

Liam demonstrates powerful features of FMOD Studio that empower distributed development teams. Learn how API Capture can be used to debug, fix and remix game audio captured from a gameplay session, without needing to be connected to the game.

Tuesday, September 27, 12:00 – 1:00

Advanced Sound Design Techniques

(Kevin Regamey)

Learn about advanced techniques in FMOD Studio that you may not have known about. Learn about event nesting, modulation and automation, scatterer sounds, AHDSRs and more

Tuesday, September 27, 2:45 – 3:45

Mixing and Mastering your Game in Real-time

(Kevin Regamey)

Kevin focuses on the techniques used in the latest games using advanced topics such as VCAs, mixer snapshots and sidechaining.

Tuesday, September 27, 4:00 – 5:00

Adaptive music with Gordon Ramsay Dash

(Dren McDonald)

Dren gives a real world demonstration of interactive music using a variety of techniques including transition timelines.

Wednesday, September 28, 9:30 – 10:30

Mixing and Debugging the Audio without the Game

See Description Tuesday.

Wednesday, September 28, 11:00 – 12:00

Advanced Sound Design Techniques

See Description Tuesday.

Wednesday, September 28, 1:45 – 2:45

Mixing and Mastering your Game in Real-time

See Description Tuesday.

Wednesday, September 28, 2:00 – 3:00

Adaptive Music with Gordon Ramsay Dash

See Description Tuesday

Wwise Sessions

Tuesday, September 27, 9:25 – 10:25

Interactive Music (Part 1) – Understanding the Process From Composition to Game Play

(Robert Brock) Interactive music is a buzz phrase that everyone has heard, but many are unclear about the workflow necessary to create a truly interactive score. To understand the process, you'll see how a conventional DAW and Audiokinetic's Wwise software can take a game that is musically void, to one where the player's actions control the musical soundscape.

Through the process you'll see how interactive music impacts...

- compositional process
- song structure and organization within a DAW
- mixing considerations
- file delivery
- integrating music assets into the game
- game play

Seeing this demonstration will help you better understand a game studio's needs and help you make better decisions during the earliest phases of the creative process.

Tuesday, September 27, 10:35 – 11:35

Interactive Music (Part 2) - Understanding the Process from Composition to Game Play

(Simon Ashby) This session invites composers and sound designers for an in-depth look into the tool chest of compositional techniques by examining a variety of Wwise projects and videos from shipped games.

Topics will cover:

- differences between dynamic and interactive music
- utilizing pre-rendered audio stems, MIDI and generative music
- classic interactive music structures
- methods to reduce repetition (and get the most out of the few megs)

By observing these integration techniques, you'll be inspired to create your own unique approach for how players are provided musical feedback and rewards, core to the mechanics of any game.

Tuesday, September 27, 12:00 – 1:00

Introduction to Wwise (Part 1) - Hands-on Quick Start to Game Sound Integration

(Robert Brock) In this fast paced session, starting from a completely blank Wwise project, you'll quickly learn the interface, discover the most important elements of the software and see how creative you can get with sound effects integration. Most importantly, you'll build your assets into a game and be able to hear your sonic masterpiece in actual game play. Bring your Windows or Mac (OS X Mountain Lion v10.8 and up) computer and headphones and we'll provide the software and project files.

Tuesday, September 27, 2:45 – 3:45

Introduction to Wwise (Part 2) - Game Play Simulation and Mixing/Performance Monitoring and Optimization

(Robert Brock)

For this hands on session, you'll begin with a Wwise project that's near completion. You'll discover powerful features that let you easily manage and mix projects of any size. You'll see how to simulate game play long before a playable game is available and once a playable version of the game is obtained, how to connect to it for real-time mixing and performance monitoring. You'll then learn how to optimize your game so that it fits within memory and cpu budgets. Attending Introduction to Wwise (part 1) is preferred but not mandatory. Bring your Windows or Mac (OS X Mountain Lion v10.8 and up) computer and headphones and we'll provide the software and project files.

Tuesday, September 27, 4:00 – 5:00

Introduction to Wwise (Part 3): Interactive Music - Hands On from Composition to Gameplay (Robert Brock) T

Interactive music is a buzz phrase that everyone has heard, but many are unclear about the workflow necessary to create a truly interactive score. To understand the process, you'll be hands-on as you discover how to take a musical

score from a conventional DAW into Audiokinetic's Wwise software. There you'll take a game that's void of any music, to one where the player's actions control the musical soundscape.

During the process you'll learn how to:

Topics will cover:

- Organize a composition in a conventional DAW so that it can be implemented into a game.
- Understand how to create a dynamic score that can react to the player's actions and changes to various circumstances in the game.
- Learn how to implement custom created music while acquiring fundamental concepts such as re-sequencing and re-orchestration techniques, switching and transition systems.
- Test and play the result of what you've learned using the game Cube.

For composers, being actively involved in the entire process from composition to gameplay will help you better understand a game studio's needs so that you make better decisions during the earliest phases of the creative process. For integrators, the introduction to Wwise's interactive music features will serve as a launchpad for creating truly reactive and dynamic music within a game.

*Introduction to Wwise Part 1 and Part 2 recommended but not required.

Wednesday September 28, 9:30 – 10:30

Introduction to Wwise; Hands-on Quick Start to Game Sound Integration

See description Tuesday

Wednesday September 28, 11:00 – 12:00

Introduction to Wwise (Part 2); Game Play Simulation and Mixing/Performance Monitoring and Optimization

See description Tuesday

Wednesday September 28, 1:45 – 2:45

Dynamic Mixing Tools and Techniques Using Wwise

(Simon Ashby) The non-linearity of games brings many challenges to mixing which requires specific tools and techniques that are non-existent for other type of media. Today's game platforms provide enough processing power to support advanced audio pipelines by incorporating real-time dynamic mixing functionality. Using real-game practical audio examples such as mix snapshots, side-chaining, and HDR audio, this session will demonstrate the many positive benefits that dynamic audio mixing can have on modern sound design.

Wednesday September 28, 3:15 – 4:15

3D Audio Implementation with Wwise

(Simon Ashby) This session will showcase 3D audio implementation techniques and approaches using the Wwise and a R&D project called "Wwise Audio Lab": A series of game environments designed to help interactive audio designers experimenting with various 3D audio methods for VR and desktop.

In this session, you'll see in Wwise and Unreal how to:

- Setup binaural technology plug-ins such as Auro3D Headphones and Oculus.
- Mix compatibility between "on screen" (over speakers or headphones) and VR media.
- Compare ambisonics and quad audio files for ambiances but also as an intermediate spatial representation format.
- Use good practices related to LOD (level of details) for VR audio.

Finally, an alpha version of Audiokinetic's "Geometry Informed Reverberation" R&D project will also be presented in which dynamic early reflections versus standard "static" reverberation systems will be compared.