Sound in Computer Games
What do we mean by game sound?

• “In a sense, game sounds (or visuals, for that matter) are never signifiers of ‘real’ events, but are always constructs covering up the technical functionality of the game engine.” Inger Ekman (2005)

• “Sound seems to extend the player’s visual perception beyond what is possible without sound.” Kristine Joergensen (2005)

• Questions around fixedness and meaning Karen Collins (2008)
Basic Model

- Speech
- Sound
- Music

Stockburger, A. (2003). The game environment from an auditive perspective
Richard van Tol, Sander Huiberts

- Interface
- Effect
- Zone
- Affect

Friberg and Gardenfors

- Avatar sounds
- Object sounds
- (non-player) Character sounds
- Ornamental sounds
- Instructions

Diegesis: Joergensen

- Sense of presence in a fictional world
- State changes in the system & environment
- Non-diegetic > Extradiegetic > Transdiegetic
- Extra and Transdiegetic sound can influence choice of action and resulting outcome

• Auditory Icons > diegetic (gunshots, footsteps)

• Earcons > extradiegetic - sounds not heard by NPC (bling!)

• Urgency function > something needs to be done

• Response > something has been done - confirmation / rejection
• Action oriented  
  (Did the punch land? Natural but usability)

• Atmospheric  
  (Emotional engagement, genre convention)

• Orienting (Location of objects / events)

• Control-related (Status updates,
• What is the context of any given sound?

• Where is the intention or attention focused... is dialogue addressed to the avatar or to the player?

• Internal / External Diegesis

• Volatility / Predictability

• Immersion > Attractors / Connectors / Retainers (McMahan)
• “In the natural world, meaningful auditory information occurs naturally as causes of a range of events such as doors closing, water running and footsteps, and they work to provide information about what is going on around us.”

Joergensen (2007), On Transdiegetic Sounds in Computer Games
Meaningful Noise: Ekman

- Diegetic - “Sneaking as a concept would in fact be impossible without an understanding of whether a sound can be heard by other characters or not.”

- Symbolic - diegetic referent

- Masking - game engine trigger

- Non-diegetic - game menu (genre sounds)

Acoustic Ecology: Schafer

- Keynote
- Soundmarks
- Signals
Acoustic Ecology of FPS: Grimshaw and Scott

- Variety of (sonic) spaces and cues within a game that all contribute to immersion
- “responsive relationships between player and the game engine”, “web of interactions occurring at a sonic level”
- Players both get and give meaning from and to the game through sound
- Ideodiegetic (Kinodiegetic / Exodiegetic)
- Telediegetic (sounds made by others)

Grimshaw, Mark and Schott, Gareth (2007) Situating Gaming as a Sonic Experience: The acoustic ecology of First-Person Shooters
Listening Modes: Chion

- Reduced
- Causal
- Semantic
Sound Layers: (after) Murch

- Foreground
- Mid-ground
- Background
Practice

- Dependencies - rendering order
- Processing power
- Memory
- Hardware
- Platform
- Compatibility
- Middleware (FMOD, WWise)
- Sound Designer or Audio Programmer?
Process

- Storyboard, Artwork, Gameplay
- Audio Design Document
- Interactivity in sound?
- Spotting (cues, menus etc) & Mapping
- Genre/Style
- Assets (objects/actions/environments)
Principles

• Audio/Visual and Sonic/Haptic Contracts
• Variation
• Modularity & Re-use (of resources)
• Efficiency & Adaptation
• Reactivity > Agency > AI
• Procedural Audio? Prototyping (PD etc)
Interactive Microstructures: Bridgett

• Narrative Cue for Cut Scene (e.g. FMV or NIS [non-interactive sequence])
• Continual Cue (e.g. menu)
• Evolving Cue (e.g. gameplay based)
• Transitional Cue (e.g. event based)
• Inaugural and Resolving Cue (e.g. intro and outro)

Bridgett, R (2010) From The Shadows of Film Sound
Variability: Collins

1. Tempo
2. Pitch
3. Rhythm / Meter
4. Dynamics
5. Timbre (DSP)
6. Melody
7. Harmony
8. Mixing
9. Form (Open)
10. Form (Branching)