



Game Audio: Beyond Aesthetics





by Adriane Kuzminski

Topics

- Expressing gameplay through game audio:
 - “Gameplay-informed audio” = game audio + screen readers
- Goals of gameplay-informed audio:
 - Can player understand where they are and can go?
 - ...what they’re supposed to do?
 - ...how they’re intended to feel?
- User Experience (UX): *user’s interactions, perceptions*
 - Usability: ease of use and learnability
 - Accessibility: enabling access for people with disabilities or special needs; enabling use of assistive technology



About me

- Freelance sound designer, passion for accessibility:
 - Accessible solutions
 - Communication between gamers with disabilities and devs
 - Accessible prototypes
 - Dialogue editor (+ other roles) for blind-accessible games:
Frequency Missing, A Hero's Call, Earplay
- Audio Communities:  Designing Sound,  A Sound Effect, The Audio Mentoring Project, GANG
- Accessibility:  AbleGamers,  GASIG (open ed. resources for accessibility in Game Design Education), GAConf '17 speaker

What is gameplay-informed audio?

- Instructional:
 - Show players how to **play** the game/what can they **do**
- Positional:
 - Show players where they **are**/where they can **go**
- Emotional:
 - Show players how they should **feel**

What is the benefit?

- Gameplay-informed audio can help players:
 - Learn to play and control the game
 - Understand the story
 - Be more engaged and informed players
- Game becomes more accessible to gamers with:
 - Visual impairments (to include aging gamers)
 - Dyslexia
 - Sensory Processing Disorders like autism or ADHD
 - Gamers who are learning a new language

What's the difference?

- Game audio = aesthetics, immersion, emotion
- Express through music, ambience, SFX, dialogue:
 - Music = beauty, emotion
 - Ambience = world building
 - Sound effects = “feeling” of actions
 - Dialogue = characters' emotions
- Less about gameplay information
- Why don't we focus more on informed audio?...

Audio and accessibility relationship

- Culture
 - People generally interact with devices visually
 - Sighted developers struggle to relate to blind community
 - Sighted people think blind gamers/developers don't exist
- Industry
 - Game, UI, UX design are visually-oriented fields
 - Late stage audio development
 - Blind accessibility on the web = screen readers fall under programming, not sound design
- We need more sound designers interested in accessibility

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Things are changing...

Audio description is here to stay

Disney films, Pixar films, and Netflix original series have audio description (2015, response to *Daredevil*)

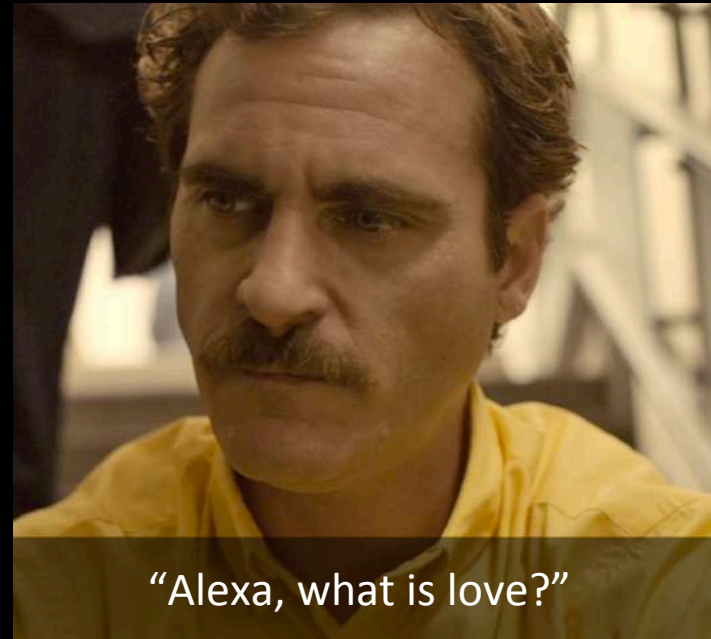


Trailer for Disney's *Frozen*
(audio description by Media Access Australia)

Interaction with devices

Siri, Cortana, Google Now:

- Vocally control phones, computers, GPS
 - “Screen readers” for sighted people
 - Blind users have VoiceOver, NVDA, Narrator, JAWS, etc.



Personal assistants:

- Amazon Echo and Google Home:
 - Less strict about commands and sound more human

Xbox One TTS (text-to-speech) API:

- Works both in-game and on Home screen

Plus, gameplay-informed audio doesn't have to sound like this...



“Overwatch but with text-to-speech sounds” — NeilBeale (YouTube)

UX Primer

- UX: focuses on user's interactions & perception of game
- 3 areas to note: individual's control, ownership, memory
- UX is: (Dagstuhl Seminar, 2011)
 - ... not technology driven; focuses on humans
 - ... not anecdotal (an individual playing game in isolation)
 - ... not synonymous with usability or User Interface design
- Usability: (*optimization*)
 - Matching user's limits in perception, attention, memory
 - Factors: ease of use, efficiency, satisfaction, and others
- Accessibility: (*access*)
 - Allow gamers with visual, motor, cognitive, auditory disabilities to play your games

User Interface Design

- UI Design: seems to be the opposite of game audio...
 - Completely visually-oriented
 - Values gameplay information over immersion

But we can learn a lot from it.

- UI Key Focus:
 - User control, user memory load, consistency
 - ‘10 Usability Heuristics for UI Design’ by Jakob Nielsen and Richard Molich, 1994b
 - Celia Hodent’s 7 usability heuristics

10 Usability Heuristics for UI Design (modified for audio)

1. Keep users informed in a timely manner (prioritize info)
2. Use logical order; speak user's language; form follows function (use real world sounds, logical structure)
3. Give **users control** & clearly marked "emergency exits"
4. Maintain **consistency** & conventions
5. Confirm before commit; **signs & feedback**
6. Recognition vs. recall; minimize **user's memory load**
7. Allow flexibility and shortcuts for experienced users
8. Limit unnecessary dialogue (Show vs. Tell)
9. Indicate problem, offer solution; error prevention/recovery
10. Provide easily retrievable help

A decorative border with ornate, scroll-like corners framing the text.

Let's hear them in action.

Instructional — SFX

UI lesson: consistent, iconic, easy to recognize/memorize
(single sound = single outcome; rules 2, 4, 5, 6, 8)

- Signs (sounds the player reacts to):
 - Diegetic: Zombies (& piano notes): *Left 4 Dead*
 - Incoming turtle shells, countdown: *Mario Kart series*
 - Sirens, radio static: *Silent Hill series*
 - Big Daddy: *BioShock series*
 - Non-diegetic: Full shadow/instinct meters: *Killer Instinct*
 - Nearby collectables: *Uncharted 2*
 - Iconic “!” alert: *Metal Gear Solid series*
 - Blind-accessible interaction cues: *Injustice 2...*

Blind Accessibility:



“Injustice 2: Accessibility Cues Demo” — Sightless Kombat

Instructional — SFX Cont.

- Feedback (confirms player's successful action):
 - Damage to enemies:
 - Hits, kicks, blocks: *Soul Calibur*, most fighting games
 - Mario's sabotage comments: *Mario Kart Wii*
 - Player's progress:
 - Herding goats: *Zelda: Twilight Princess*
 - Nathan Drake puzzle comments: *Uncharted 3*
 - Enemy radio: *Metal Gear Solid: Ground Zeroes*
 - Puzzle complete: *Zelda: Ocarina of Time*

Instructional — SFX Cont.

UI Lesson: Follow patterns, logic (rules 2, 4, 6)

- Range of meaningful SFX:
 - Individualized firing, footsteps: *Overwatch*



UI Lesson: Error prevention (rules 9, 10)

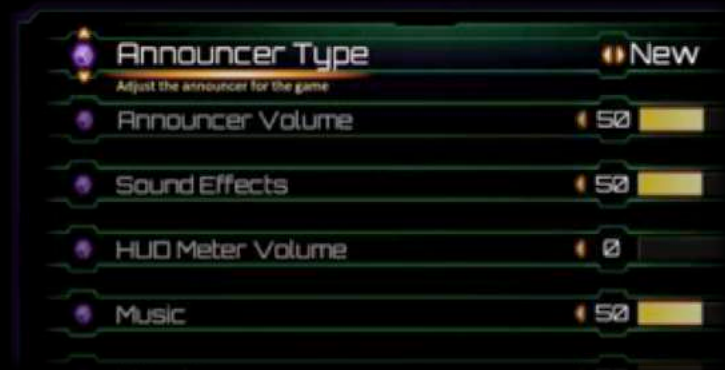
“Overwatch – Heroes’ Footsteps – Sounds”
— Android_24 (YouTube)

- Warning sounds:
 - Dying breaths & heartbeats: *Amnesia: Dark Descent*
 - Engine sounds and co-driver voice: *DiRT Rally*
- Dynamic music:
 - Entering battle area: *Fallout & Elder Scroll* games
 - Time is running out: *Mario* games

Instructional — Mix

UI Lesson: Clarity, keep users informed (rules 1, 6, 8)

- *Overwatch*: “The Elusive Goal: Play By Sound”
 - Avoided occlusion on ultimate abilities
 - Mix prioritized immediate enemy threats
- *Killer Instinct* “Greater accessibility through audio in *Killer Instinct*”
 - Focused on player movements: footsteps, jumps, landing, Foley movements, etc.
 - “Ambient loops and sweetener layers that didn’t provide strong player feedback were backed off a bit.”



Instructional — Dialogue

UI Lesson: Allow flexibility for experienced users (rules 3, 7)

- Text-to-speech (TTS): (*A Hero's Call* on next slide)
 - Varying speed rates for advanced users, localization
 - In-game API for Xbox One

UI Lesson: Recognize vs. recall (rule 6)

- Spoken:
 - Individual ultimate abilities: *Overwatch*
 - Turret talk: *Portal*

UI Lesson: Limit unnecessary dialogue (rule 8)

- Selective TTS or spoken dialogue: Tower Defense demo
 - Used TTS for signs (tower/defender menu, # of enemy/gold)
 - Used iconic SFX for feedback (confirm selections)

Instructional — Dialogue

Blind Accessibility:

Text to speech: *A Hero's Call* — Out of Sight Games

Spoken menus:



Frequency Missing — The University of Skövde

Instructional Cont.

Benefits of Blind Accessibility:

- **Blind and Low Vision:**
 - 253 million (*WHO, Oct 2017*)
- **Aging:**
 - 27% of gamers in the US are over 50 (*ESA, 2016*)
 - 51% of 55-64 years olds play games in Australia and New Zealand (*IGEA*)
- **Dyslexia:**
 - Most common learning disability: 10-20% of world population, 13-14% of school population require Special Education services (*IDA, 2016*)
- **Second Language: English/Spanish**
 - 500 million (*British Council, Cervantes Institute, 2016*)



Positional

UI Lesson: Signs (direction given to player; rule 5)

- Stereo panning:
 - Left/Right panning: Standard in games; harder pan can benefit blind accessibility: *Killer Instinct*
 - Touch-activated panning: Find point & click items with sound by dragging finger: *Frequency Missing*
- 3D audio:
 - VR audio plugins: dearVR, Aspic Engine, Steam Audio, The Papa Engine, etc.
 - Leading sounds in 3D world: *Papa Sangre, A Blind Legend*

Positional Cont.

NOTE: Positional audio is not only about the mix when it comes to accessibility. We must also show the players:

- Where to focus their immediate attention
- Confirm their personal direction (north, facing NPC, etc.)
- Where their immediate goal is in relation to them, as well as their past and future goals in RPGs (mental mapping)

UI Lesson: Feedback (confirm direction & keep users informed in a timely manner; rules 1, 2, 5)

- Verbal confirmation of leaving play area: *MGS: Ground Zeroes*
- Memorable open world ambiences: *Silent Hill 2, Fallout 3*
- Also...

Positional Cont.

- Audible paths (visual examples):
 - Red climbing paths: *Uncharted*
 - Locator: *Dead Space*
- Sonar:
 - *Alien: Isolation*, *A Hero's Call*
- Audio description:
 - *The Baker Street Experience* for Alexa (+ *A Hero's Call*, *Frequency Missing*, *Earplay*, *Codename Cygnus*)
- Cardinal directions:
 - *A Hero's Call*, *Swamp*



The Baker Street Experience
— Schell Games



A Hero's Call — Out of Sight Games

“Play by Sound”

Key points for informed audio inspired by UI design:

- Allow players to learn to control the game with audio
 - Hearing what is happening is not the same as knowing how to manipulate the experience
- Both are limited by short-term memory; minimize what needs to be memorized
- GUI static/timed icons & text take up screen space; SFX and spoken text take up the soundscape
- Limit unnecessary dialogue through iconic sounds
- Use signs and feedback for accessible audio information
- Use consistency and conventions

Accessibility is Important

We have blind-accessible solutions for accessing books (Braille, audiobooks), films (audio description), and the internet (screen readers), so let's not forget games.

Accessible games encourage:

- Shared experiences for blind and sighted players
- Job placement in games industry (programmers, sound designers, and voice actors with visual impairments)
- Access to human expression and stories
- Expression through games by people with visual impairments
- Better game design for everyone

Genres that can be accessible now

Games that allow players to make one choice at a time and allow enough time to make an informed decision can be blind-accessible. *(Only some of the games listed are blind-accessible)*

- Point and click adventures: *Frequency Missing, Telltale Games*
- Turn-based strategy games: *A Hero's Call, Pokémon, Persona*
- Turn-based sports games: *Madden 2018* (haptics)
- Trading card games: *Hearthstone*
- Side-view fighting games: *Mortal Kombat, Injustice, Skullgirls*
- Interactive story games: *Her Story, Alexa/Earplay games*
- Text adventures: *King of Dragon Pass, Choice of Games*
- Visual novels: *STEINS;GATE, Narcissu*
- Tower defense games: *TD2D prototype*

Interested in Accessibility?

Remember:

- Audiogame Jam (started by James Kyle) is every October
- Games don't have to be audio-only to be blind-accessible
- Make sure it is actually accessible by **testing with blind gamers**
- Accessibility is not about limiting your creative vision but **removing unintentional “designed disabilities”** so more people can play
- Don't underestimate how people use sound to play – sighted gamers like Seagull (pro *Overwatch*); blind gamers like Brandon Cole, Tomasz Tworek, Sightless Kombat ...



“Killer Instinct: Season 1 Story Mode:
Jago VS Boss Shadow Jago: 30+ Matches”
— Sightless Kombat

Select Resources

- AbleGamers: [Includification, Player Panels](#)
- Zach Quarles: [Article & talk about blind accessibility in *Killer Instinct*](#)
- Per Anders Östblad talk: [‘Audio Driven Game Design’](#)
- Brandon Cole talk: [GAConf 17](#)
- My GAConf talk: [‘Breaking the Sound Barrier’](#)
- Scott Lawlor, Tomas Neumann talk: [‘The Elusive Goal: Play by Sound’](#) [‘Wwise Tour 2016’](#)
- Designing Sound blind accessibility series: [Per Anders Östblad, Kedar Shashidhar & Drew Becker interviews](#)
- Celia Hodent articles: [Developing UX practices at Epic Games](#), [Gamer’s Brain & UX misconceptions](#)
- Eduardo H. Calvillo-Gámez, Paul Cairns, Anna L. Cox: [Core Elements of the Gaming Experience](#)
- Siu-Lan Tan, PhD: [‘Do You Play Better With the Sound On or Off?’](#)
- Sander Huiberts, Richard van Tol: [IEZA framework](#)
- John Dewey: [‘Education & Experience’](#)
- Roto, Law, Vermeeren, Hoonhout: [Bringing clarity to the concept of UX](#)
- Jakob Nielsen & Richard Molich [10 Usability Heuristics for UI Design](#)
- Smash Clay Audio resources page:
 - [Blind accessible games list](#)
 - [Twitch streamers with visual impairments you should follow](#)
 - [More accessibility articles](#)
- Twitter: [#a11y](#), [#accessibility](#)

Thanks to Out of Sight Games, Sightless Kombat,
Bonnie Bogovich, and Per Anders Östblad for their examples,
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Thanks!



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