Sound in games and the User Experience (UX)

CS-330: Introduction to Game Programming

How sound impacts user experience

- “Setting the mood, ambiance, and atmosphere”

  Sounds, sound effects, and music can impact the level of immersion and realism the player experiences.
- “Emotional trigger”

  Sounds, sound effects, and music can be used strategically to invoke empathy in players.
- “Gameplay feedback”

  Sounds, sound effects, and music can signal a campaign about to begin, or the harbinger of something nefarious about to happen.
- “Spatial awareness to navigate”

  Sounds and sound effects can be placed strategically within the player’s stereo audio space to hint where walls exist within a cave (based on sound echoes) or can hint where tumbling rocks have fallen (i.e. follow the sound and where it emanates from).

Source: https://www.juegostudio.com/blog/sound-design-in-games

Practical guidelines for UX sound integration

- “Establish a sound strategy”

  How will audio be used to communicate with the player (e.g. selection confirmation, providing feedback, defining an ambient mood, etc.)
- “Balance sound design with other UX elements”

  Each sound or sound effect should serve a purpose and complement visual detail without audibly overwhelming the user.
- “Consider accessibility and user control”

  Provide a means for user to reduce or disable sounds or sound effects. Also consider how audio can be complemented with visual cues for hearing impaired users.
- “Choose subtlety over intrusiveness”

  Avoid sudden, prominent, loud sounds; instead, prioritize nuanced audio cues.

Source: https://www.uxmatters.com/mt/archives/2024/08/the-role-of-sound-design-in-ux-design-beyond-notifications-and-alerts.php

Challenges with Sound Design in Games

“The non-linearity of sound”:

- Video games are a dynamic, non-linear form of entertainment.
- Sound must evolve in various levels and states of game-play to maintain a consistent level of realism and immersion.

Source: https://kevurugames.com/blog/harnessing-the-potential-of-video-game-sound-design/

Challenges with Sound Design in Games

“The unpredictability of sound mixing”:

- The player’s actions which trigger real-time sound at any given instance can result in cacophony. Consequently, realism or player engagement may be compromised.

Source: https://kevurugames.com/blog/harnessing-the-potential-of-video-game-sound-design/

Challenges with Sound Design in Games

“Repetition”:

- Advantage: Reinforces player experience when users hear familiar sounds for given actions or accomplishments (e.g. picking up loot, reloading a weapon, casting a spell, leveling-up, etc.).
- Disadvantage: A repetitive sound can diminish user engagement and become boring if the sound is overused in a game.

Source: https://kevurugames.com/blog/harnessing-the-potential-of-video-game-sound-design/

Lessons-learned: Sounds to avoid

“Sharp sounds should be avoided.”

- Sounds with a sudden attack should be avoided.
- Utilize a compressor to reduce the dynamic range of the sound.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Sounds shouldn’t be repetitive.”

- Utilize slightly different versions of the same sound effect.
- Example: picking up gold coins should not invoke the same exact digital audio sound effect of coin clinking. Vary up the clinking sounds to increase player immersion and realism.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Sound effects must be designed to interact with themselves and with music.”

- When designing sound effects, listen to how sound effects blend with the music in the game. Does such a blending have a detrimental effect on the music or the sound effect?
- Avoid music tones that can mask or distort the sound effect if both are played concurrently.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Don’t re-use OS sounds for your software.”

- Utilizing the built-in OS sounds for a game in a way that is inconsistent with ways that sound is used in other applications can change the fundamental meaning and impact of that sound.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Don’t underestimate the user’s power of recognition.”

- If the sound can be utilized in your game application to alert the user AND that sound effect is contextually consistent with other applications that use the same sound effect, utilize it in your game application.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Use each OS’s particular sounds on their respective platforms.”

- Android users may not be familiar with the built-in sounds for Apple’s iOS and vise-versa.
- Mobile application users such as Android or iOS may not be familiar with desktop audio sounds such as Windows.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Let users choose what they want to hear.”

- Include the ability to mute or adjust the volume independently for each of the following: sound effects, music, or dialog.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Produce in a high quality system, test in low quality systems.”

- Game players will be listening to audio from your game on a variety of consumer-grade headphones and speakers.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Don’t trap sounds to a certain frequency.”

- For those players who are not hearing impaired, how will they perceive and react to the timbre present in your sound?
- Instead of a certain frequency, utilize a variety of frequencies within the typical hearing range of humans.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Not everything needs a sound effect.”

- Don’t overload the player with too many sound effects.
- Make the experience representative of real-life where some situations generate minimal or no sounds (e.g. nodding your head, waving your hand, walking on sand).

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Unless music is part of the gameplay experience, keep it low-profile.”

- The music should not detract from the visual experience. Keep it in the background.
- Maintain a narrow dynamic range (i.e. the loudest musical passages versus the quietest musical passages).
- Be consistent in music key.
- Be consistent in the beat tempo.
- Avoid loud drum and bass.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Create melodies in layers.”

- Compose closely-related melodies and motifs through inversions.
- Iterate over each inversion to minimize musical repetition.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd

Lessons-learned: Sounds to avoid

“Take your time.”

- Seek feedback from others concerning the music you’ve composed for a game.
- Does the music make sense in a given scene?
- Does the music convey a certain feeling?
- How do game players react to the music component of your game?
- Music composition is an art. It takes time and patience to get it right.

Source: https://medium.com/@fernando1lins/lessons-learned-in-audio-feedback-for-game-and-app-design-e4818c9b72fd