Heads-Up Display (HUD) and User-Interface (UI) design

CS-330: Introduction to Game Programming

What is a HUD?

HUD defined:

• HUD or Heads-Up Display serves as a dashboard of information for the player during gameplay.

HUD's function:

• "It bridges the game's virtual world and the player, delivering crucial details about the game state, character status, inventory, maps, health, ammunition, and much more in real time."

Source: https://polydin.com/game-hud-design/

What typically belongs in the HUD?

Examples of common elements in HUD:

- "Health and Stamina Bars"

- "Ammo and Weapon Information"

- "Minimap and Map"

- "Objective Tracker"

- "Score and Points"

- "Inventory and Equipment"

- "Compass"

- "Dialogues and Character Interactions"

- "Currency"

- "Status Effects"

Source: https://polydin.com/game-hud-design/

Heads-Up Display (HUD) versus User Interface (UI) design: Roles

The role of the UI (User-Interface):

- "...refers to the entire set of on-screen elements that players interact with to navigate the game, access menus, manage inventory, and perform various in-game actions. The UI encompasses everything from the main menu, character inventories, health bars, maps, dialogue boxes, and more. It is a comprehensive system that facilitates communication between players and the game world, providing essential information and controls."

The role of the HUD (Heads-Up Display)

- "...a specific subset of the UI [User-Interface]. It consists of real-time information and indicators superimposed on the gameplay screen without obstructing the player's view."

- "The HUD is designed to provide crucial information to players during gameplay without requiring them to access separate menus or interfaces."

Source: https://polydin.com/game-hud-design/

Advanced Design Strategies For Effective Heads-Up Display (HUD)

"Minimalism and Clutter Reduction"

- HUD elements take up valuable screen real-estate!

- Prioritize the use HUD elements.

- Integrate HUD elements into character (see last slide of presentation for example).

Source: https://polydin.com/game-hud-design/

Advanced Design Strategies For Effective Heads-Up Display (HUD)

"Customizable HUD Elements"

- Allow the player to scale or relocate HUD elements.

- Allow the player to adjust the transparency of HUD elements.

Source: https://polydin.com/game-hud-design/

Advanced Design Strategies For Effective Heads-Up Display (HUD)

"Dynamic Contextual Display"

- Display HUD elements on a contextual-basis based on gameplay.

- Examples:
  1. "health bars appearing during combat"
  2. "objective markers appearing when relevant goals are nearby"

Source: https://polydin.com/game-hud-design/

Advanced Design Strategies For Effective Heads-Up Display (HUD)

"Visual Hierarchy and Grouping"

- Strategically organize HUD elements around the screen for optimum player view.

- Utilize scaling and color schemes to emphasize HUD element importance.

Source: https://polydin.com/game-hud-design/

Advanced Design Strategies For Effective Heads-Up Display (HUD)

"Interactive and Reactive Elements"

- Reactive HUD elements get the player's attention during critical times of game play.

- Examples:

    1. "Health bars may flash red when critical health is low."

    2. "Objective markers may pulse or animate to draw attention to important objectives."

Source: https://polydin.com/game-hud-design/

Advanced Design Strategies For Effective Heads-Up Display (HUD)

"Contextual Feedback and Notifications"

- Visual or auditory techniques can effectively notify the player of "important events, milestones, or achievements".

Source: https://polydin.com/game-hud-design/

Advanced Design Strategies For Effective Heads-Up Display (HUD)

"HUD Customization Options"

- Allow the player to adjust or disable each HUD element to best suit their needs for gameplay and accessibility.

Source: https://polydin.com/game-hud-design/

Advanced Design Strategies For Effective Heads-Up Display (HUD)

"Adaptive HUD Scaling"

• HUD elements should adapt to various screen resolutions, aspect ratios, and devices yet still remain viewable and useful to the player.

Source: https://polydin.com/game-hud-design/

Advanced Design Strategies For Effective Heads-Up Display (HUD)

"Multiplayer and Co-op Integration"

- Design HUD elements to accommodate multi-player campaigns where multiple player information is shared on one screen.

Source: https://polydin.com/game-hud-design/

Advanced Design Strategies For Effective Heads-Up Display (HUD)

"Accessibility Considerations"

- Include alternative methods for communicating HUD element information for players who are visually or hearing impaired.

- Include alternative methods for game-input for players with mobility impairments.

Source: https://polydin.com/game-hud-design/

Effective techniques to minimize HUD elements

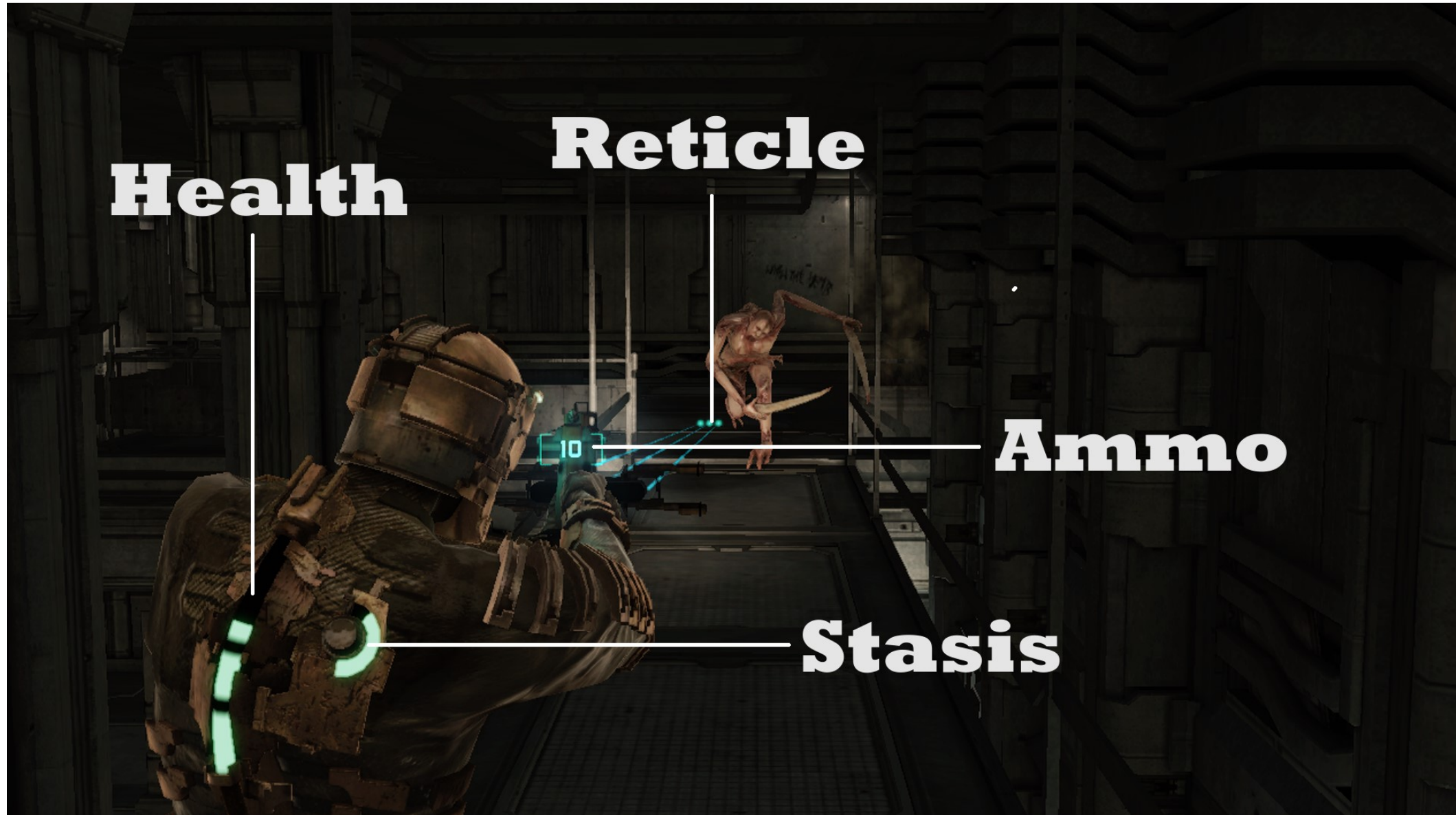**Integrate HUD elements into the game:**

- Remove ammo counter (number of remaining bullets) from HUD by integrating this count into the player's weapon.

- Remove health meter from HUD by communicating the player's health through sight and sound:
    1. Play audio sounds like gasping for air and/or a slow heartbeat.
    2. Tint the player's view of the world with varying gradients of red to indicate the player's character is bleeding.
    3. Blur player's view of the world to indicate diminishing health (player's vision is declining).

- Play an audio alert sound when a player's shield protection is depleted and the player will sustain damage when hit.

Remove static elements from HUD:

- The borders around HUD elements is purely cosmetic but takes up valuable space. Remove such borders to reduce clutter.

Source: https://www.gamedeveloper.com/design/off-with-their-huds-rethinking-the-heads-up-display-in-console-game-design

Example: HUD elements integrated into the character

Source: https://pixune.com/blog/game-hud-design/