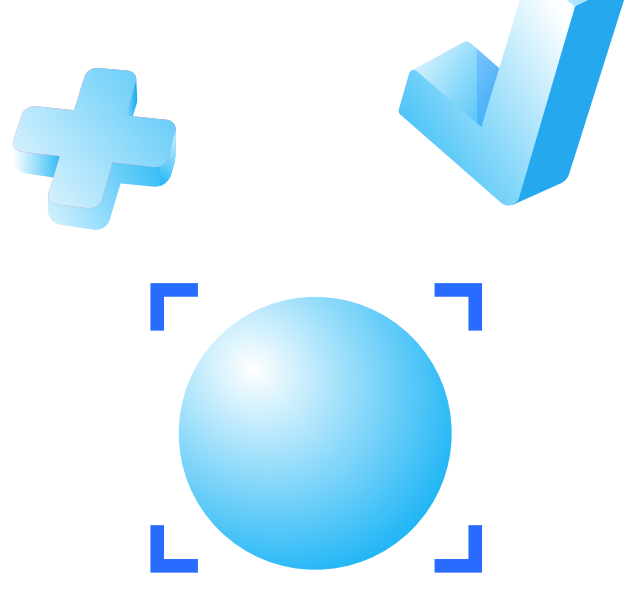


Design Considerations for AR/VR, Voice, and Haptic Interfaces

AR/VR

Context Awareness

AR/VR interfaces should be responsive to users' environments. Incorporating real-world elements and considering factors like lighting, occlusion, and object recognition creates a more natural experience.



AR/VR

Spatial UI Elements

Spatial UI elements, such as 3D objects, create a more immersive experience than 2D elements. Depth, scale, and spatial relationships convey hierarchy and guide user interactions. Designers should move beyond rectangle-based UIs and use real-world objects as inspiration for interactions to foster the best experiences.

AR/VR

Intuitive Interactions

To make interactions feel natural and familiar to users, let people manipulate virtual objects directly instead of displaying separate buttons. Since AR/VR experiences are still novel, interactions should be easily discoverable and consistent. To that end, provide clear visual cues and offer instant feedback to guide users through the experience.



AR/VR

AR/VR

No Clutter

Immersive experiences may be overwhelming for users. Limiting the elements in the visual field and offering simple ways of engaging can make experiences more manageable. Digital overlays and interactive objects should be straightforward, avoiding unnecessary clutter or complexity.

Voice Interface

Clear, Natural Communication

Users shouldn't have to learn new languages or remember a large set of rules in order to communicate. Voice interfaces must convey information and instructions concisely, in ways that feel natural.



Voice Interface

Audio Cues and Feedback

Cues and feedback can help users navigate the interfaces and understand the results of their actions. Distinct sounds, tones, or voice responses allow people to distinguish different types of interactions.

Voice Interface

Error Recovery

Misunderstandings may occur. A voice interface should be designed to handle unexpected user inputs or errors without frustrating users.



Voice Interface

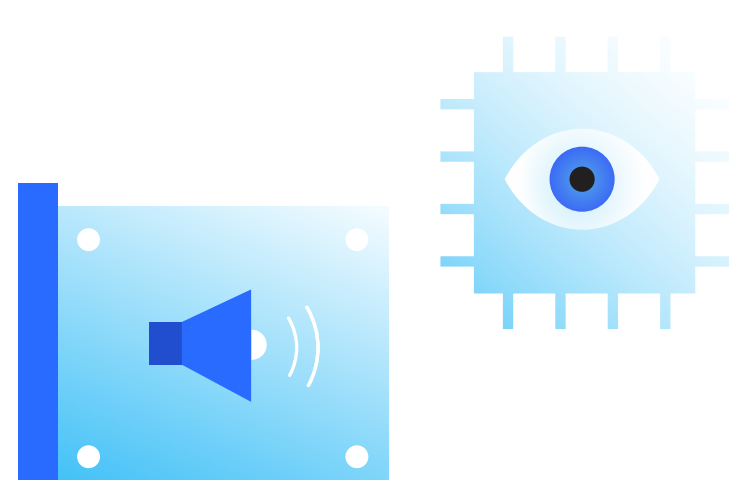
Context Awareness

Depending on the information available, designers can enrich the voice interaction experience by considering the users' identities, environments, time zones, and other relevant factors. This can create more personalized and seamless experiences.

Haptic

Hardware Capabilities

Vibration intensity, frequency range, and duration differ from device to device, so the first step to making informed design decisions is to know the hardware's limits.



Haptic

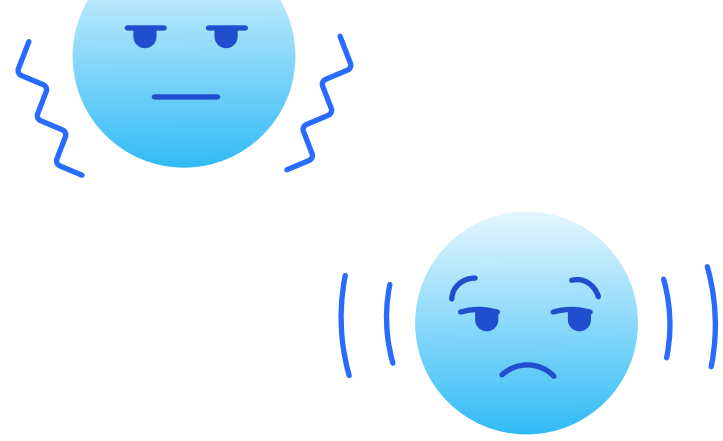
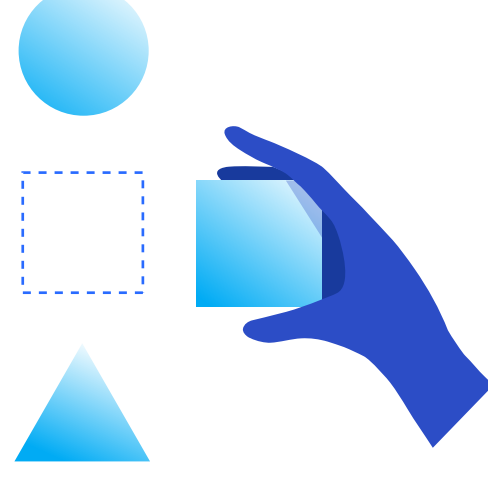
Enhanced Experience

Few devices use haptic feedback as their primary communication method. Instead, designers enhance the overall user experience by providing meaningful and relevant tactile cues. Where can haptic feedback add value? Where can it work well with other elements like voice and visual cues?

Haptic

Consistency

Haptic patterns should signal similar interactions and meaning across the interface. Consistency helps users build a mental model of how to interpret haptic feedback within a system.



Haptic

Usage

Excessive or unnecessary vibrations can lead to user fatigue, annoyance, or desensitization to essential cues. Haptic feedback should be used judiciously, only when it provides real value to the user experience.