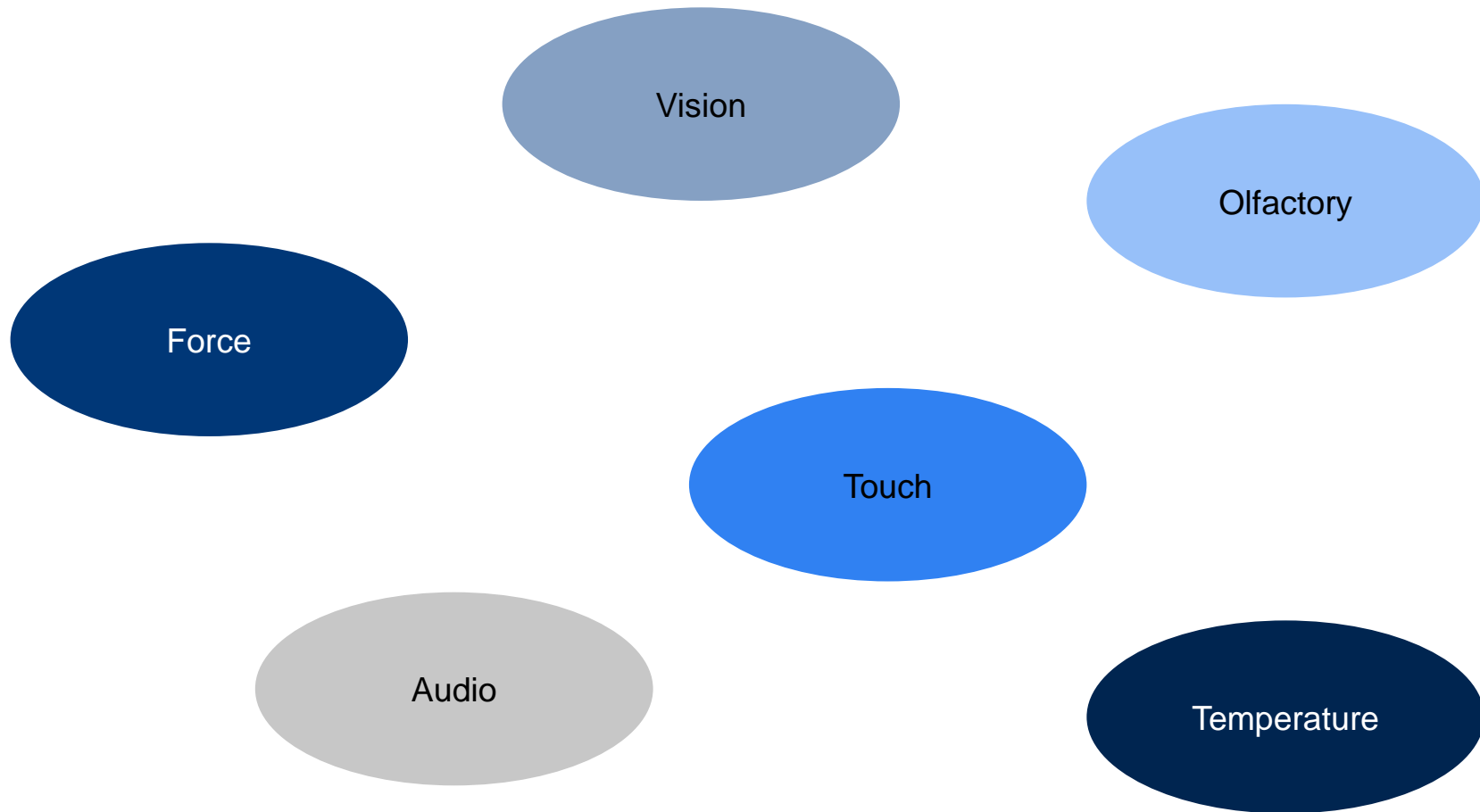


Feedback



Why is feedback that important?



Imagine you walk on a bridge.

You don't fall because you **see** the rails.



<https://www.welt.de/reise/hab/article230842405/Portugal-Laengste-Fussgaenger-Haengelbruecke-der-Welt-eroeffnet.html>

Why is feedback that important?



Imagine you walk on a bridge, and you are blind.

You don't fall because you **touch** the rails.



<https://www.welt.de/reise/hab/article230842405/Portugal-Laengste-Fussgaenger-Haengelbruecke-der-Welt-eroeffnet.html>

Why is feedback that important?



Imagine you walk on a bridge, you are blind and you are numb.

You can feel the **unbalance**.

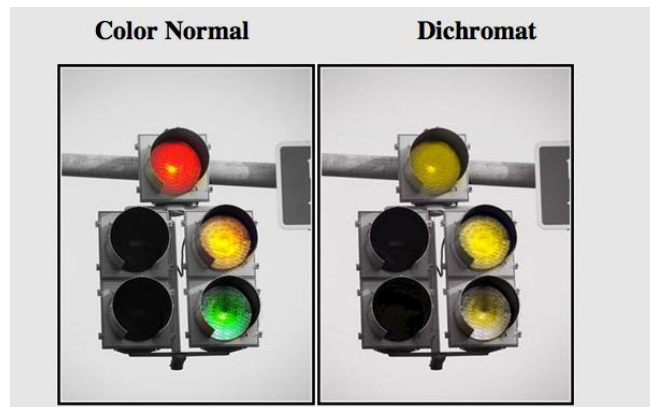
to be continued...



<https://www.welt.de/reise/habricle230842405/Portugal-Laengste-Fussgaenger-Haengtbruecke-der-Welt-eroeffnet.html>

Feedback matters at nearly all tasks of your life. If your feedback system is not working properly, you are required to find a workaround

Visual feedback matters



Haptic feedback matters



Haptic feedback refers to the use of tactile sensations or touch feedback to communicate information to a user.

....



Press
next



Press
next

Here I am



- Important for telemanipulation
- Helps if system is precise but not accurate
- Very intuitive
- (Most of the time) easy to understand
- Humans are pretty used to it from daily life

Telemanipulation refers to the technology and techniques used to control and manipulate objects or devices remotely.

Press
next

Here I am



What is the difference between haptic and tactile?

In which cases is tactile feedback important?

How can you use it for amputees?

What is the difference between force and touch?

Haptic Feedback	Tactile Feedback
Uses technology like haptic devices and vibration motors	Relies on physical buttons, surface textures, and other tangible elements
Synthesizes physical sensations to replicate touch-related experiences	Enhances the sense of touch with physical elements

<https://flatiron.com/blog/haptic-vs-tactile-feedback/>

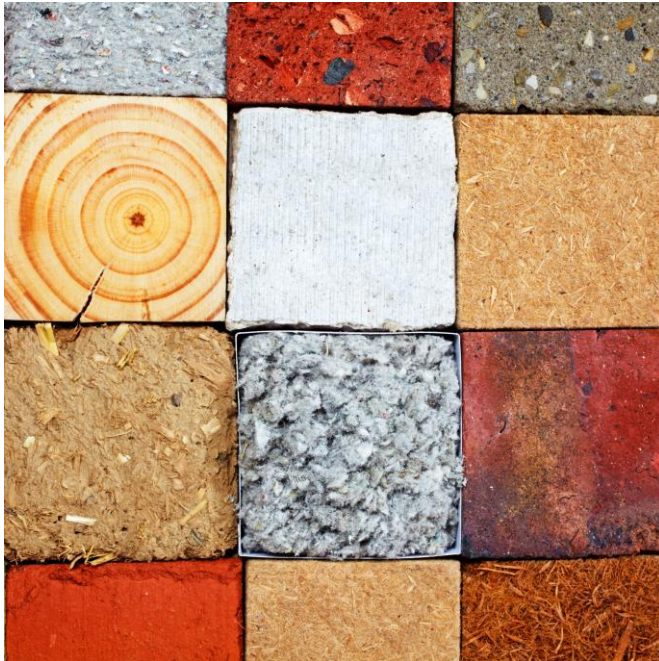


What is the difference between force and touch?

In which cases is tactile feedback important?

How can you use it for amputees?

In which cases is it important? In which not?



Sensing different materials

Sensing different textures

What is the difference between force and touch?

In which cases is tactile feedback important?

How can you use it for amputees?

Prosthetic Limbs:

Sensory Feedback: Incorporating tactile sensors in prosthetic limbs to provide feedback about pressure, texture, and temperature. This can help amputees better control and feel their prosthetics, making them more functional and intuitive to use.

Vibration Motors: Embedding small vibration motors to simulate different tactile sensations, enabling amputees to distinguish between different types of surfaces or detect when they are holding an object.

Sensory Substitution:

Wearable Devices: Devices that convert tactile information into other sensory signals (e.g., auditory or visual) can help amputees receive tactile feedback through different sensory channels.

Skin Stimulation: Using electrical stimulation on the residual limb to simulate tactile sensations from the prosthetic limb, providing a more integrated sensory experience.

Temperature can help e. g. to detect danger,

How could you use heat and cold for other applications?



<https://www.akademie-sport-gesundheit.de/magazin/schutzreflex-wenn-die-hand-die-heisse-herdplatte-beruehrt.html>



DIY:

Prosthetic Limb Control:

Functionality Indication: Audio cues can signal the status of different functions (e.g., gripping strength, mode switching).

Error Notification: Alerts when something goes wrong or if adjustments are needed.

Sensory Substitution:

Tactile Information: Audio feedback can represent tactile sensations such as texture, temperature, and pressure by mapping these sensations to specific sounds or tones.

Environmental Awareness: Sounds can provide information about surroundings, helping amputees navigate safely.

In what situations is audio feedback helpful?

Accessibility: For individuals with visual impairments, audio feedback provides essential information that they cannot obtain visually.

Environmental Constraints: In dark or low-visibility environments, audio feedback ensures that users can still receive necessary information.

When is audio feedback superior to visual feedback?

Attention Management: Audio feedback can capture attention more effectively in scenarios where visual attention is divided, such as driving or multitasking.

Mobility and Portability: Audio feedback is more practical when users are on the move and cannot constantly look at a screen.

Alerting and Alarming: For critical alerts, such as emergency alarms or timer notifications, audio feedback is more effective in grabbing immediate attention.

Situational Awareness: In environments where maintaining situational awareness is crucial, like during sports or while operating machinery, audio feedback provides essential information without the need to divert visual focus.

Where is audio feedback used in our daily life?

Smartphones: Ringtones, message alerts, and voice assistants (e.g., Siri, Google Assistant).

Home Appliances: Beeps from microwaves, washing machines, and dishwashers indicating the end of a cycle.

Vehicles: Audible signals for seatbelt reminders, turn signals, and parking sensors.

Computers and Gadgets: Error beeps, notification sounds, and startup chimes.

Public transport: Announcements

How could you use audio feedback for assistive devices?

Screen Readers: For individuals with visual impairments, screen readers convert text on a screen into speech, allowing them to navigate and interact with digital content.

Auditory Alerts: Devices can use sounds to alert users to changes or important events, such as medication reminders or changes in health metrics.

Voice Commands: Assistive devices can be controlled using voice commands, providing an interactive and accessible way for users to manage technology.

Environmental Sensors: Devices that detect obstacles or changes in the environment (e.g., for the visually impaired) can provide audio cues to navigate safely.

Feedback for Wearables: Wearable devices, such as fitness trackers, can use audio feedback to inform users about their progress or health status without requiring visual confirmation.