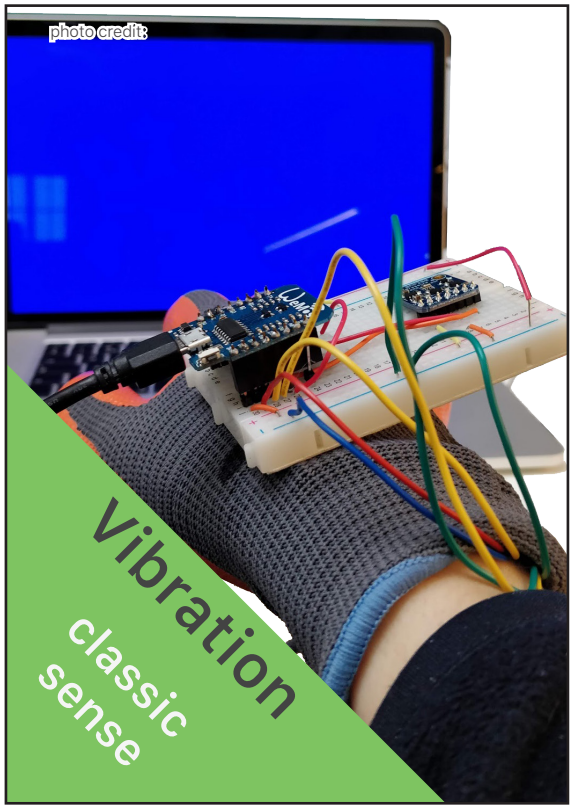
photo credit:
Vibration
classic
sense

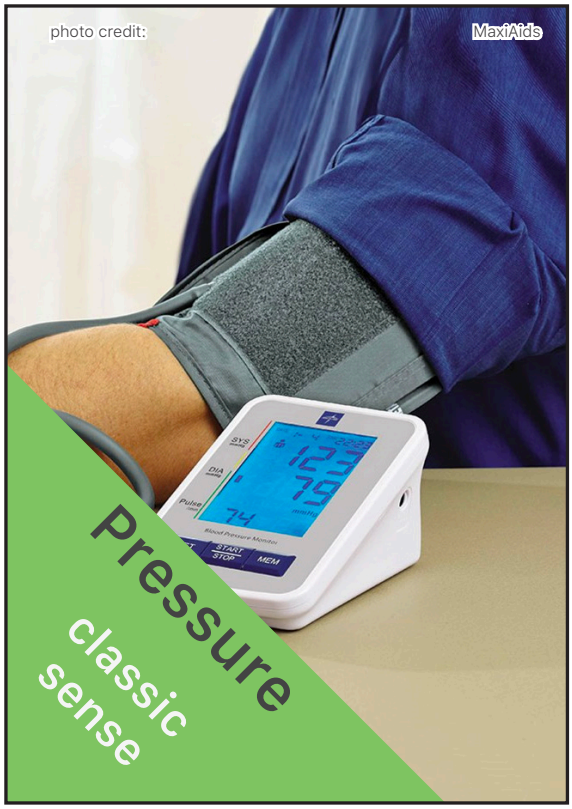
photo credit:
MaxiAids
Pressure
classic
sense


photo credit:
wirecutter
EMS
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sense

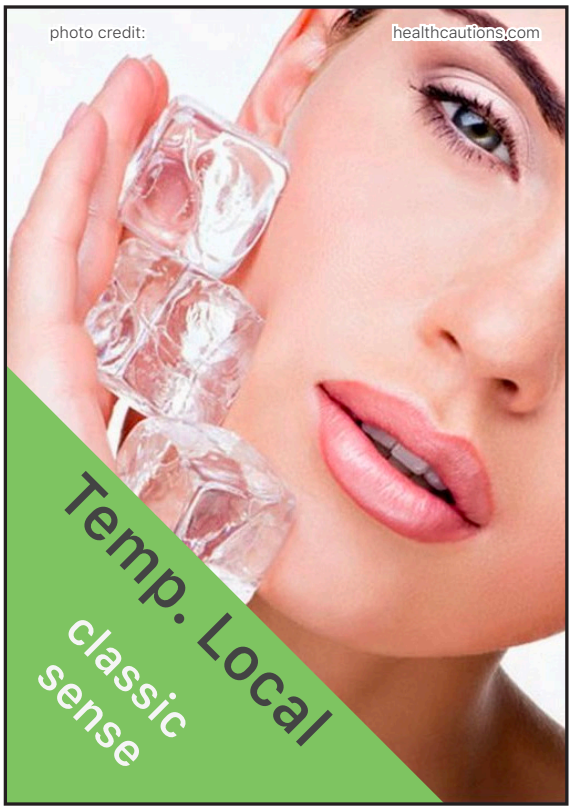
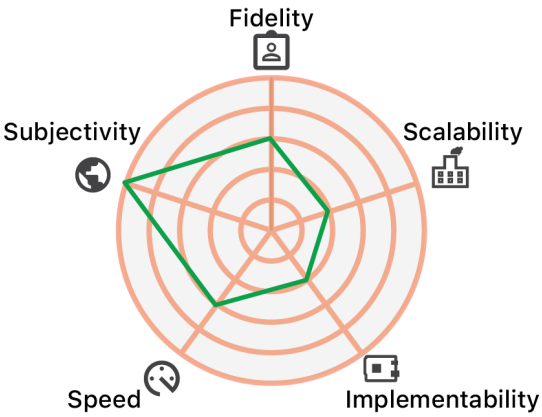
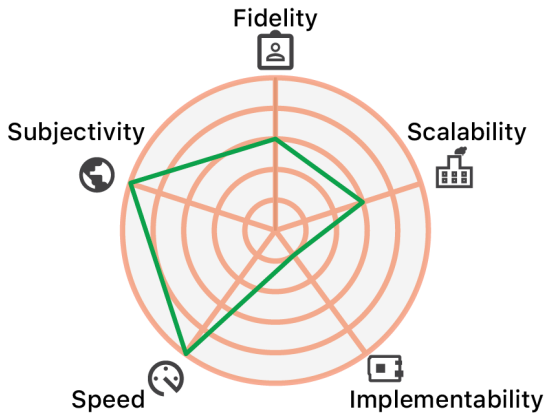


photo credit:
healthcautions.com
Temp. Local
classic
sense



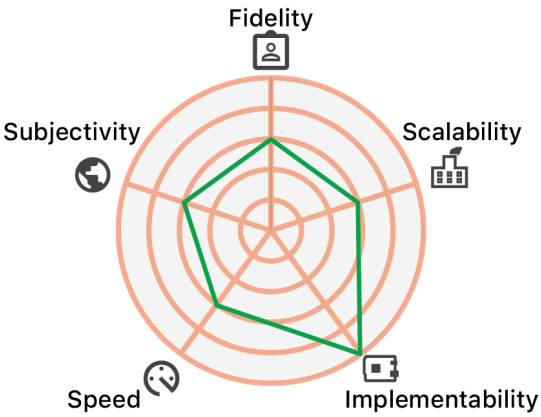
Pressure

Pressure is a force exerted over an area of the skin, again part of the somatic system, with highly sensitive receptors on the fingers and lower sensitivity receptors on the rest of the skin. Since the higher sensitivity receptors work together with vibration and stretch to from the perception of texture, this sense focuses on pressure as in squeezing the body.



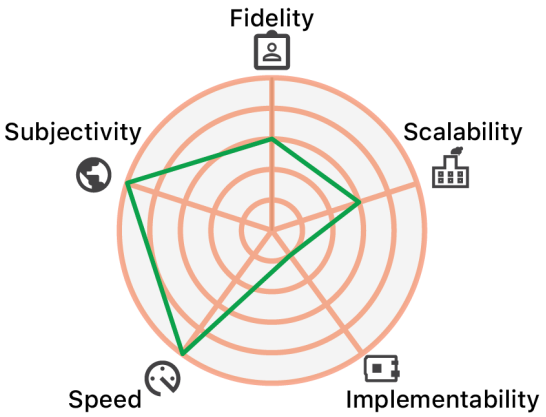
Vibration

Vibrations are mechanical oscillations of force applied to the skin. This is usually done via vibration motors or linear actuators placed on the users' skin. This sense is often used in HCI projects and can be found as a simple, low fidelity solutions such as in cell phones.



Temp. Local

Skin can sense it's temperature to a relative degree (above or below body temperature) and is able to do so for a small area. This means a user will be able to tell when a heater is placed only on a certain part of their body.



EMS

Electrical muscle stimulation is the process of using electrodes to trigger a user's muscles. On lower amperates, this merely causes a buzzing sensation, however, at higher voltages this causes muscular twitching.


photo credit:
Kevin LaSean
Temp. Global
classic
sense

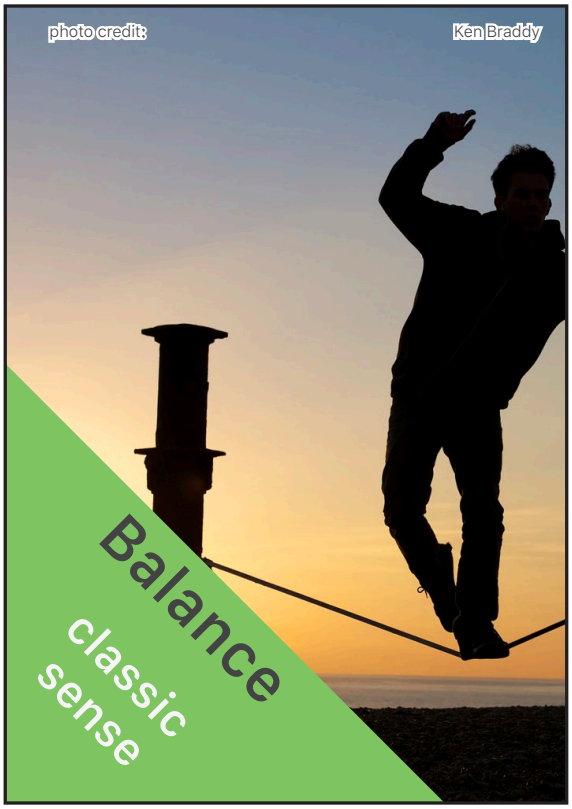


photo credit:
Ken Braddy
Balance
classic
sense


photo credit:
Ambre Blends
Smell
classic
sense

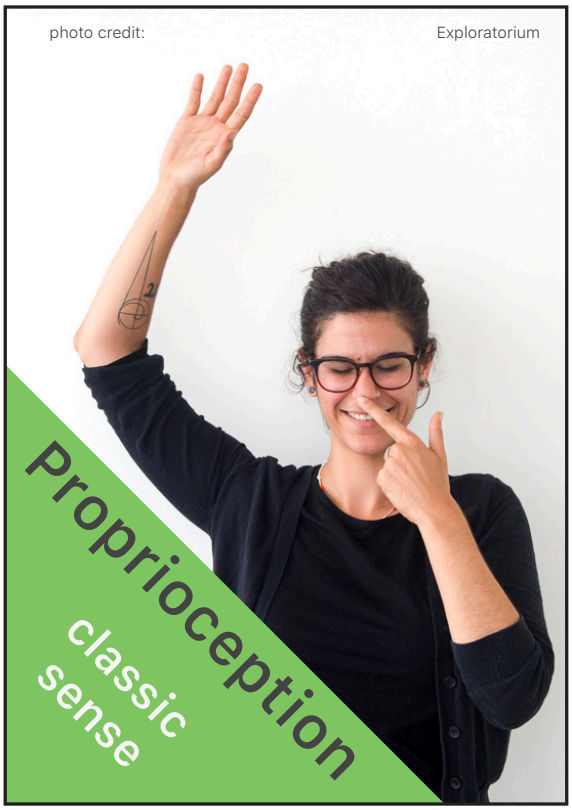
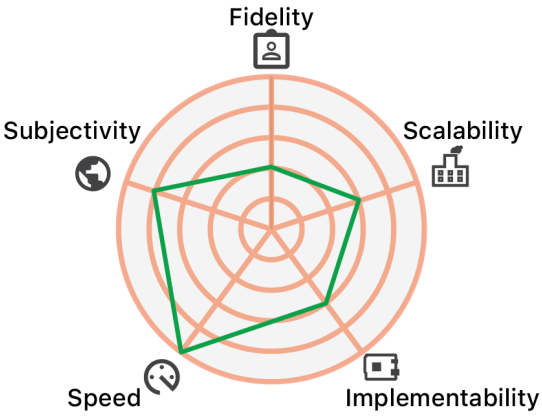
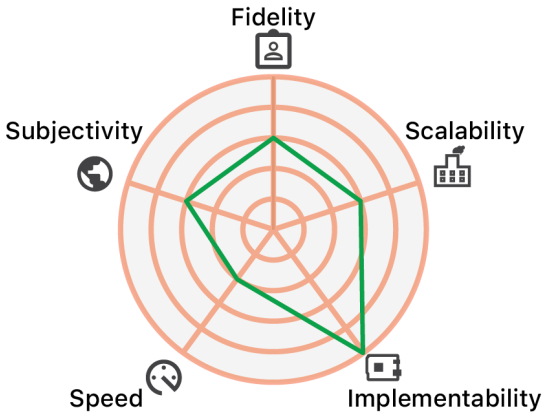


photo credit:
Exploratorium
Proprioception
classic
sense



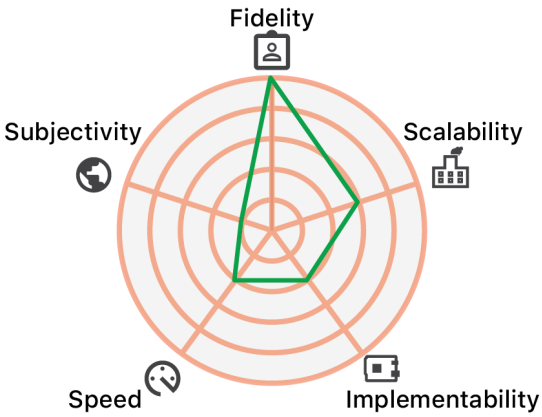
Balance

In this case, balance refers only to the Vestibular System, responsible for angular orientation of the head.This allows the user to feel the sensation that their head is tilting to the left or right.
The technical term for this process is Galvanic Vestibular Stimulation or GVS.



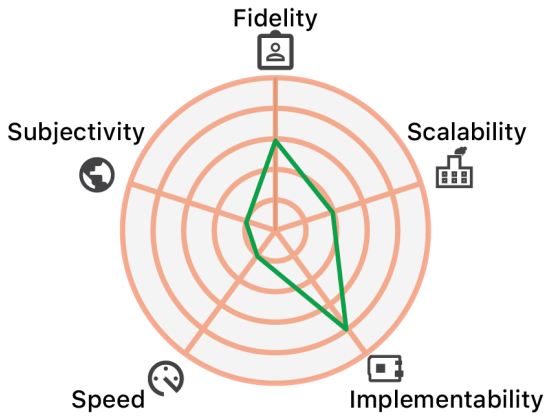
Temp. Global

Skin can sense it's temperature to a relative degree (above or below body temperature) and extrapolate this to the temperature of the users' environment. (Lawson, 2013) This is noted as global temperature.



Proprioception

Proprioception is the ability of the body to tell where it's limbs are using nerves in the muscles, tendons and joints. This has proven immensely important in ensuring the user feels present in the virtual world, and concurrently the failure to anticipate proprioception causes the loss of presence.



Smell

The human sense of smell is a complex mechanism that recognizes certain rich combinations of chemicals (Proctor & Proctor, 2012).
Unfortunately, no "base elements" of smell have been able to reproduce arbitrary smells. Thus, systems are limited to whatever smells the designer puts in them to begin with.