

Cutaneous Displays

DEA 3250/6510

Cutaneous Information

- Touch can be used as sensory replacement for sighted persons in many ways. Used to guide people when light is limited or it is dark.
- Controls can be shaped differently.
- Things can be more or less desirable by their feel (texture, rough/smooth, firm/soft, slimy/sticky, wet/dry, etc.).

Cutaneous Information

- Cutaneous senses can be engaged via:
 - Texture, tactile display (haptic), shape
 - Vibration - vibro-tactile display - small pins that vibrate, or electrical means through a mechanical or electrical transducer.
 - Pacinian corpuscles - Sense changes in the skin, heat, etc. They are not equally distributed over the body. Highest density is at the tips of the fingers. Different parts of the body have different receptors.
 - Electrocutaneous stimulators, ultrasonic friction displays, and rotating disks for creating slip sensations.

Tactile Displays - Braille

- Louis Braille (born 4th Jan. 1809), at Coupvray, near Paris. Accidentally blinded at 3 years of age. Sent to the Paris Blind School in 1819. At age 11 he adapted a secret code devised for military use (night writing used by soldiers to communicate after dark) -based on a twelve-dot cell, 2 dots wide by 6 dots high. Each dot or combination of dots within the cell stood for a letter or a phonetic sound. But the human fingertip could not feel all the dots with one touch. Braille reduced this to a cell of six dots that meant that a fingertip could encompass the entire cell unit with one impression and move rapidly from one cell to the next. In 1829 he devised a practical scheme for printing and writing in tactile print - Braille.

Example: Braille Signs

- Braille can be combined with conventional visual signs.

Olfactory Displays

- Olfactory displays are used in some applications. Examples:
 - Natural gas is odorized with methyl mercaptan (CH_3SH) for safety
 - Mine safety systems ("stench systems").
 - Odors can increase or decrease product desirability (e.g. new car odor, clean clothes odor).
 - Japanese companies introduce odors into offices; air fresheners add odorous chemicals into the air; some fragrances add human pheromones.
 - Scratch and sniff products.

Taste Displays

- Taste - This changes the desirability of products. Examples include:
 - Medicines.
 - Toys.
 - Pen tops (so children will not swallow them).
 - Envelopes.