User Interface for Assistive Devices/Technology Definitions

- **Human/Technology Interface** - boundary between human and AT across which information is exchanged.
  - control of device (control interface, selection set and method)
  - feedback regarding device operation (audio or visual)

- **Control Interface** (ex. Keyboard, joystick) - the hardware by which human controls the AD. Discrete vs. continuous input included.

- **Selection Set** (ex. Letter, numbers on a standard keyboard) - items available from which choices are made, visual or auditory. The size, modality and type of selection set based on user needs and desired activity output.

- **Selection Method** - Direct vs. Indirect Selection.
  - **Direct Selection** - control interface used to randomly choose any item in the selection set.
  - **Indirect Selection** - intermediate steps required for selection (ex. scanning, encoding).
User Interface for Assistive Devices/Technology

Characteristics

- **Spatial** (ex. Light switch vs. switch array)
  - dimensions, shape, weight
  - number of available targets
  - size of each target
  - spacing between targets

- **Sensory** (feedback)
  - Auditory
  - Somatosensory (tactile/feel of interface)
  - Visual

- **Activation/Deactivation**
  - method of activation or release (see examples)
  - Effort
  - Displacement
  - Flexibility
  - Durability
  - Maintainability
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Selection and Evaluation of Control Interface

• Identify The Needs
  - What is the activity to be performed?
  - How many input signals are required?
  - Is there more than one activity to be carried out?
  - If so, is same control interface adequate for all activities? Integrated or Distributed Controls?

• Outcomes of Evaluation
  - Description of unique sensory needs
  - ID potential anatomical control sites
  - Determine functional ROM of control sites
  - Determine resolution skills
  - Determine potential benefit of control enhancers
    • any aid or strategy that enhance or extend physical control to use a control interface (ex. mouthstick, arm supports)
Direct vs. Indirect Selection

- **Direct Selection**
  - Various Types of Keyboard (standard, ergonomic, tongue touch)
  - Pointing Interfaces (mouse, trackball, head-controlled mouse, light pointer)
  - Speech Recognition (speaker-dependent and trained vs. speaker-independent, phonologist)
  - Eye Control (eye blinks/stares, IR detection and recording, head-(dash-dot communication). Darci code uses an 8-way switch code (joystick positioning).

- **Indirect Selection**
  - Auto-Scanning - selection set presented on display, sequentially scanned by cursor on device. When a particular element is presented, user generates a signal. Rate of scan is set by user.
  - Step Scanning - switch is activated for each item, second switch or dwell used for acceptance signal.
  - Inverse Scanning - hold to initiate scan, release to select.
  - Directed Scanning - user selects direction of scan, the set is scanned sequentially by the device, then signal is generated by user.
  - Coded Access - Morse code is common example
AAC – Augmentative & Alternative Communication Systems

- AAC devices are used when there exists difficulty in writing or speaking. Clinically, refers to any communication that requires something other than a person’s own body.
  - Pad and pen
  - Picture communication board
  - Electric communication device
  - Voicebox

- Conversational AAC System – Common conversational abilities should be programmed into an AAC device:
  - Greetings
  - Farewells
  - Questions
  - Repairs

- Graphical Types - writing, mathematics, drawing and plotting.