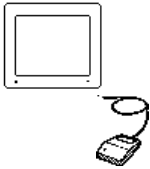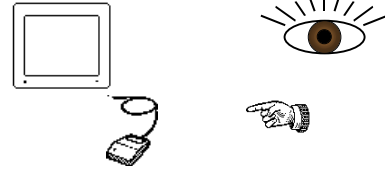## what does a graphical interface say about a user?
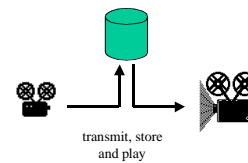
what does a graphical interface say about a user?

different media

- not just a load of old text and graphics
- speech and language
- sound - beeps, buzzes, scrapes and music
- handwriting, sketches and gestures
- video, animation, web-cams
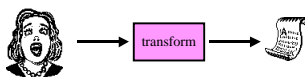- touch, haptic and force-feedback
- bio-sensors

how much does the computer understand?

- uninterpreted
  - recorded messages, web-cam, multimedia, retrieval
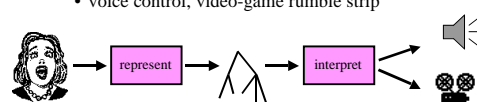
transmit, store
and play

how much does the computer understand?

- uninterpreted
- interpreted
  - transcription - conversion between media
    - OCR, dictation, 'tidying' freehand drawings. MIDI

transform

how much does the computer understand?

- uninterpreted
- interpreted
  - transcription - conversion between media
  - semantics - real understanding
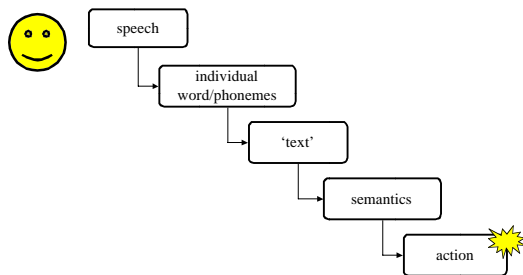   - voice control, video-game rumble strip

represent   interpret

speech - many levels

- phoneme — smallest units of speech
- allophone — combinations of phonemes
- morpheme — small words or parts of words
- words
- sentences and grammar
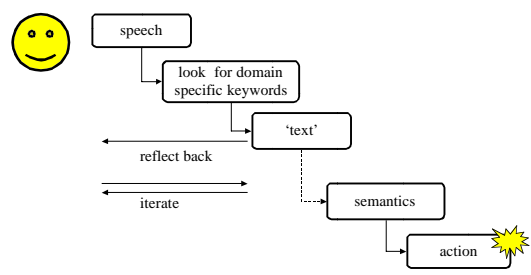- semantics
- conversation

speech recognition some issues

- phoneme co-articulation
- word separation
- speaker dependence
- small vs. large vocabulary
- different languages ... tonal etc. ...
- homophones - bough / bow
- addressing: accidental commands
- quoting: saying 'stop' in a telegram

traditional recognition model

speech → individual word/phonemes → 'text' → semantics → action

interactive model

speech → look for domain specific keywords → 'text' → semantics → action

reflect back

iterate

non-speech sounds

- ecological
  - plonk in the bin
  - filling water = file copy
- non-ecological
  - earcons - short note sequences

networked media

- QoS (quality of service)
  - bandwidth, latency, jitter, reliability, ...
- media
  - video - dropped frames OK
  - speech - missing sound - disaster
- mode
  - real-time - jitter can disrupt conversation
  - streamed - use buffering (latency) to overcome jitter

all our senses
approaching reality

virtual reality

augmented reality

tangible bits - real objects represent virtual
ubiquitous computing - computation in devices

physical world