Sketching: interaction, modeling and perception

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Creative communication

The transformation of a creative vision into a digital reality, that is easy to refine and reuse.

Why is it challenging?

Humans have an audio IN and OUT,
a **biased** video IN but no explicit video OUT!
  ^
we need WYSIWYW instead of WYSIWYG!

video IN: Perception

- **Visual field:** one eye looking straight at the horizon, with a narrow cone of vision, while standing still.

- **Visual world:** two eyes looking all around with peripheral vision, while moving dynamically.

[**J. Gibson, 1950**. The Perception of the Visual World, *Houghton Mifflin*.]

video OUT: Sketching

Most children between the ages of about 9-11 have a passion for realistic drawing. They become sharply critical of their childhood drawings and begin to draw certain favorite subjects over and over again, attempting to perfect the image. Anything short of perfect realism may be regarded as failure. ... Perhaps you can remember your own attempts at that age to make things "look right" in your drawings, and your feeling of disappointment with the results. ... Looking at your drawings, you may have said, as many adolescents say, "This is terrible! I have no talent for art. I never liked it anyway, so I'm not doing it anymore."

[**B. Edwards, 1999.** The New Drawing on the Right Side of the Brain, *Tarcher/Putnam.*]

Digital Sketching Philosophies

- ## Symbolic vs. Perceptual.
  what you know vs. what you see.

- ## Precision vs. free-form.
  engineering vs. ideation.

- ## Static vs. Dynamic.
  finished sketch vs. temporally evolving lines.

- ## Single-view vs. Multi-view sketching.
  to explore additional dimensions which could be...
  3D shape, time or design choices.

Line Sketching Workflows

2D

- Stroke filtering. (clothoids, multi-stroke... what are we filtering?)
- Stroke Processing. (sketch widgets, gestures...)
- Stroke appearance (NPR, neatening...)
- Stroke dynamics (pressure, tilt, direction...)
- Seamless UI Control (sketch widgets, crossing menus, gestures...)
- Navigation (paper manip., onion skinning...)
- 2D curve creation: (What are desirable curves, how do we
  perceive them in relation to our design knowledge?).
- Stroke Perception (what spatio-temporal information do they convey?)

3D (Additional dimension for 3D design, animation or 2D design explorations)

- 3D Navigation. (camera tools, single/multi-view, view bookmarks...).
- 3D curve creation: (2D stroke to 3D curves perception & inference).
- Animation (motion trails, evolving shape fronts...)
- Alternate Designs (co-locating them in space...)

...moves on to filling in regions of space/colouring/painting.

Agenda

We will pick a theme every week and go over the representative papers in the area.

Those taking the course for credit will do little demo programs to test out various hypotheses wrt. to sketching.

One of us will lead the discussion...

Next week (or perhaps the week after the SIG. deadline?)

- The gestalt of strokes and stroke perception (what spatio-temporal information do they convey?)

  (I will send out a few papers).

General coverage of topics

2D

- Stroke filtering.   (clothoids, multi-stroke…)
- Stroke Processing.   (sketch widgets, gestures…)
- Stroke appearance (NPR, neatening…)
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