CogSketch Basic Operations
This Section

• Starting a sketch
• Drawing glyphs
  – Inking
  – Conceptual labeling
• Layers
• Subsketches & the metalayer
• Saving sketches
Creating a Sketch in CogSketch

• There are three types of sketches

- Worksheet authoring will be discussed later
- We’ll start with general sketches
- Perceptual Sketchpad will be discussed later
What you should see
Two Core Problems of Sketch Understanding

• Segmentation: How to break up ink into pieces corresponding to depicted entities?

• Interpretation: What is being depicted?
Traditional Solutions

• Segmentation: Heuristics
  – Pen up, long pauses taken as evidence for segmentation
  – Overlapping speech

• Interpretation: *Which-of-N* recognition
  – Fixed vocabulary of entities (10-100)
  – Train system on each user individually
  – Train users via feedback
Open-Domain Sketch Understanding

- Segmentation: User signals via a button
  - Draw ink for glyph

- Interpretation: User specifies via selection from large (58,782 as of 8/30/08) set of concepts
Creating a New Sketch - Glyphs

After you click the *glyph* button it toggles to *finish*.

Draw the glyph then click the *finish* button (also available via right-click).

The status indicators tell you the state of the ink processors.

Sunglasses indicate it is paused, because it is collecting your ink for subsequent processing.
Status Indicators

Status of drawing interaction understanding:

- **Idle**
- **Processing**
- **Understood**
- **Confused:** Rarely happens

**Ink Processor**
- **Idle**
- **Waiting.** You get smoother inking if it doesn't try to process while you are drawing
- **Both processors running**
- **Slacking.** If you aren't drawing and queues are non-empty, touch to awaken
- **Crashed.** (Very rare) Touch to restart

**Voronoi Processor**
Creating a New Sketch - Glyphs

When you are done drawing a glyph it shows up selected in the drawing pane.

The **bounding box** is also shown.
Creating a New Glyph – Conceptual Labeling

• The name is a string used to refer to the glyph in reasoning
• You can also conceptually label the glyph with concept(s) from the OpenCyc KB
• You can also browse the KB to look for collections

CogSketch will try to symbol-complete with collection names from the KB as you type

Use the +/- to add/remove collections

Name of the glyph
Types of Glyphs

• There are three types of glyphs that you can use in CogSketch
  – **Glyphs**: Standard glyphs, used to represent entities in a sketch
  – **Relations**: Represent binary relationships between other entities in the sketch
  – **Annotations**: Used to assign a quantitative or qualitative value to another glyph
Relation Glyphs

Relation glyphs are drawn just like regular glyphs, except you use the `Relation` button instead of the glyph button.

Relation glyphs are always arrows — `direction matters`!

Arrows should be drawn as two or three strokes. The longest stroke is interpreted as the shaft of the arrow.
Relation Glyphs

You conceptually label a relation glyph as well.

Symbol completion will give you the binary relations in the KB.
Relation Glyphs

When you select a relation, the roles are auto-filled with glyphs near the tail and head of the arrow.

The relation with roles filled:

(advisorFor Ken Andrew)

Browse the KB to learn more about roles for relation.
Relation Glyphs

Oops! Our arrow is backwards!
Annotation Glyphs

An annotation is drawn the same way as a glyph or relation, except ...

... you must select the glyph you are annotating in order to make the annotate button available.
Annotation Glyphs

You can specify a value and units for an annotation.

Unit list is populated based on type of annotation.
The structure of sketches

- Think of layers as transparent sheets stacked on top of each other
  - Multiple layers in the same bundle can be visible at the same time
  - Spatial relationships will only be computed between objects on the same layer

- Each sketch must have at least one bundle, and each bundle must have at least one layer
- Only one subsketch is active at one time
- Multiple layers in the same bundle may be visible at the same time
Interpreting Layers

- For every layer you specify a **genre**
- Abstract-view
- Discrete-graph-view
- Geospatial-view
- Physical-view

The default genre is physical view. This is a sticky default.
Interpreting Layers: Pose

• For physical-view and geospatial-view genres you will also be asked to select a **pose**

  Pose describes the frame of reference from which the sketch is made

• Determines how visual directions map into spatial directions
  – E.g., up in visual reference frame = up in spatial reference frame if looking from the side

  The default is looking-from-side. This, too, is sticky
Adding a Layer

Use the **New Layer** button

**Normal Layer** is for sketching

A **Fixed Image** allows you to specify an image file to use as a background image
Adding a Layer

The highlighted layer is the one you are drawing on.

Both Audience and Tutorial layers are visible.
Adding a Layer

You can toggle visibility of layers on and off using the V button on the layer.

Here we can see the audience layer, but not the tutorial layer.

The selected layer is always visible.
Adding a Layer

You can also toggle text labels on and off using the $T$ button.

Text labels will be the names you gave the glyphs.
Adding a Layer

The D button toggles whether direction arrows are shown, for entities that have them. This is specified in the knowledge base, and can be changed by experimenters.
Adding a Layer

The G button displays a given layer grayed out

(here the audience layer is grayed out)
Adding a Subsketch

You can add a subsketch using the **New Subsketch** button.

Or by using the clone right-click operation on the subsketch in the metalayer.
Conceptually Labeling a Subsketch

Subsketches are used to represent something else -- for example, a subsketch can be used to represent an event or a physical object. Select the things your subsketch represents in the yellow box to the right, and use the arrow button above to add them to the list of things represented by this subsketch (the white box above).

Things represented by the subsketch can be removed using the 'X' button.

Pushing the 'More Choices' button will give you a wider range of choices for the types of things your subsketch can represent.

An important specialization of Situation and thus also of IntangibleIndividual and TemporallyExistingThing (q,v). Each instance of Event is a dynamic situation in which the state of the world changes; each instance is something one would say "happens". Events are intangible because they are changes per se, not tangible objects that effect and undergo changes. Notable specializations of Event include Event-Localized, PhysicalEvent, Action, and GeneralizedTransfer. Events should not be confused with TimeIntervals (q,v). The temporal bounds of events are delineated by time intervals, but in contrast to many events time intervals have no spatial location or extent.
The Meta-layer

You may have noticed this other layer that is always available – the meta-layer
The Meta-layer

The meta-layer shows you all of the subsketches in one sketch.

Here we can see both the tutorial subsketch and the coffee break subsketch.
The Meta-Layer

These descriptions are called comic graphs because they generalize comic strips.

You can also define relationships between subsketches:
- Steps in a process
- Different levels of granularity...
What you have seen

• How to draw glyphs
• Types of glyphs: Objects, relationships, annotations
• Structure of sketches
  – Layers, subsketches, and the metalayer