Design Buddy: Sketch Understanding in Design Education
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Design Buddy is an educational software program that will help us achieve several goals:
• Improve the ability for engineering and design students to communicate their ideas through sketching.
• Improve CogSketch as a tool for cognitive modeling and as a platform for educational software.
• Generate sketch data for use in developing cognitive models of sketching and design.

Motivation

Qualitative Mechanics
Qualitative Mechanics will allow Design Buddy to understand and solve problems in physics dealing with systems of objects and forces.
• Systems modeled using this previous work include linkages, clockworks, pumps, and engines.
• Implemented as a set of concepts and logical statements for reasoning in FIRE.

CogSketch, a SILC Initiative
Design Buddy will be built on CogSketch, an open-domain sketch understanding system which features:
• Conceptual labeling from the contents of the OpenCyc knowledge base, consisting of over 58,438 concepts constrained by 1.8 million facts. (Cycorp, http://www.cyc.com)
• FIRE inference engine capable of reasoning over large knowledge bases.
• Analogical reasoning and inference via the Structure Mapping Engine (Falkenhainer, B., Forbus, K. & Gentner, D. 1989).

Spatial relationships are computed for sketches labeled by concepts in the knowledge base. FIRE and SME can then reason over these to infer meaning behind the sketch.
CogSketch can provide a basis for cognitive simulation of spatial learning and reasoning, and for creating educational software that understands sketches in a human-like way. Learn more at: http://spatiallearning.org/projects/cogsketch_index.html

Next Steps

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