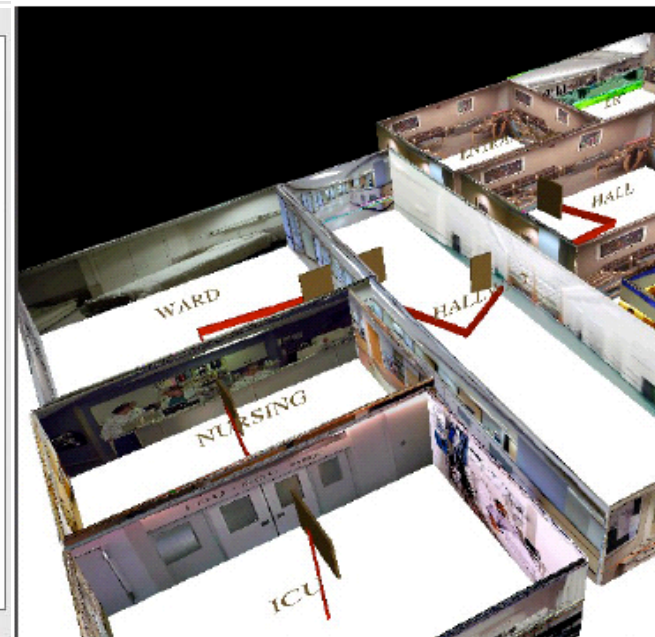
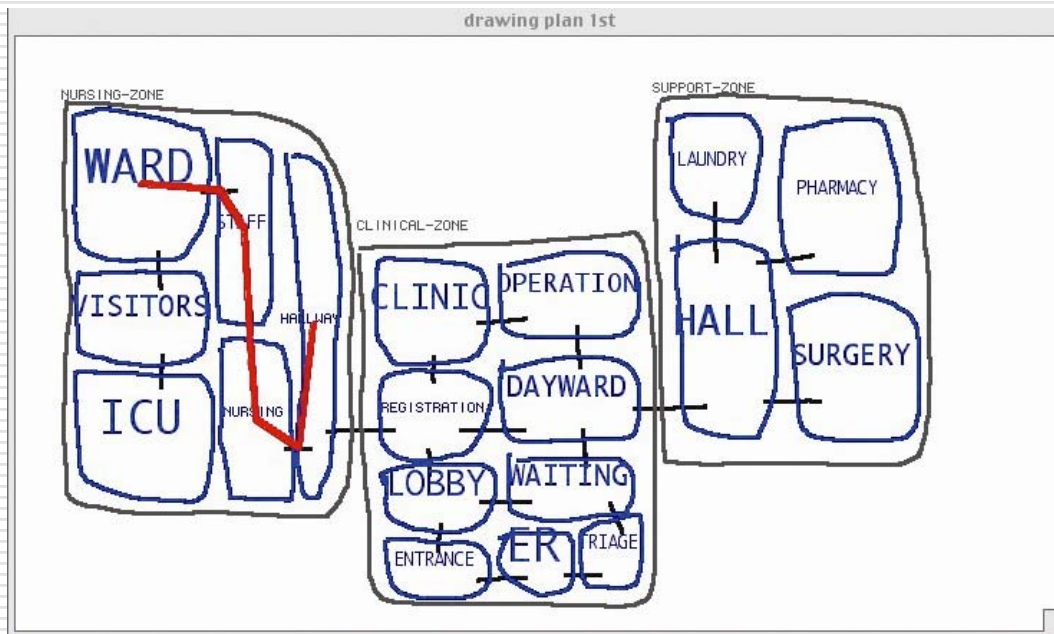


Critiquing Freehand Sketching

A Computational Tool for Design Evaluation

Yeonjoo Oh, Ellen Yi-Luen Do, Mark D. Gross



Outline

- **Introduction**
 - **Reasoning with Sketches**
 - **Related Work**
 - **Design Evaluator**
: Computational Tool for Reasoning with Design Critiques
 - **Discussion**
-

Roles of Sketching

- ❑ **Reflection-in-Action (Schön & Wiggins)**
: seeing-moving-seeing cycle
 - ❑ **Restructuring & Emergence (Verstijnen)**
 - ❑ **Visual Thinking and Imagery (Goldschmidt)**
: Seeing as & Seeing that
-

Reasoning with Sketches

□ Michael Graves

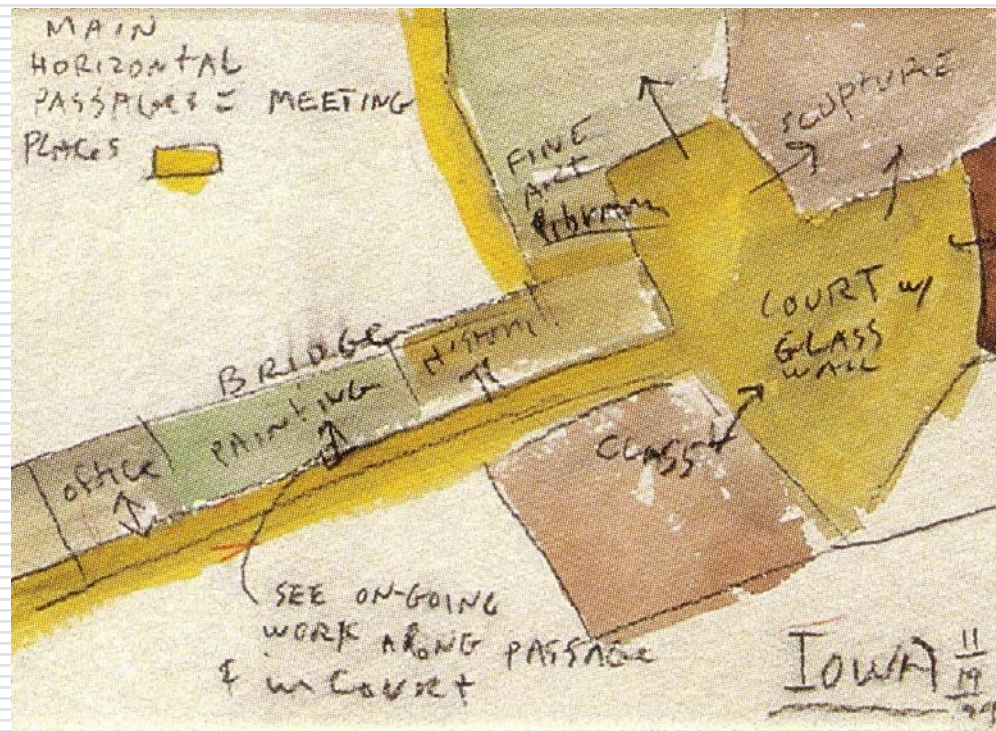
*".....record my observations and **discoveries**"*

□ Steven Holl

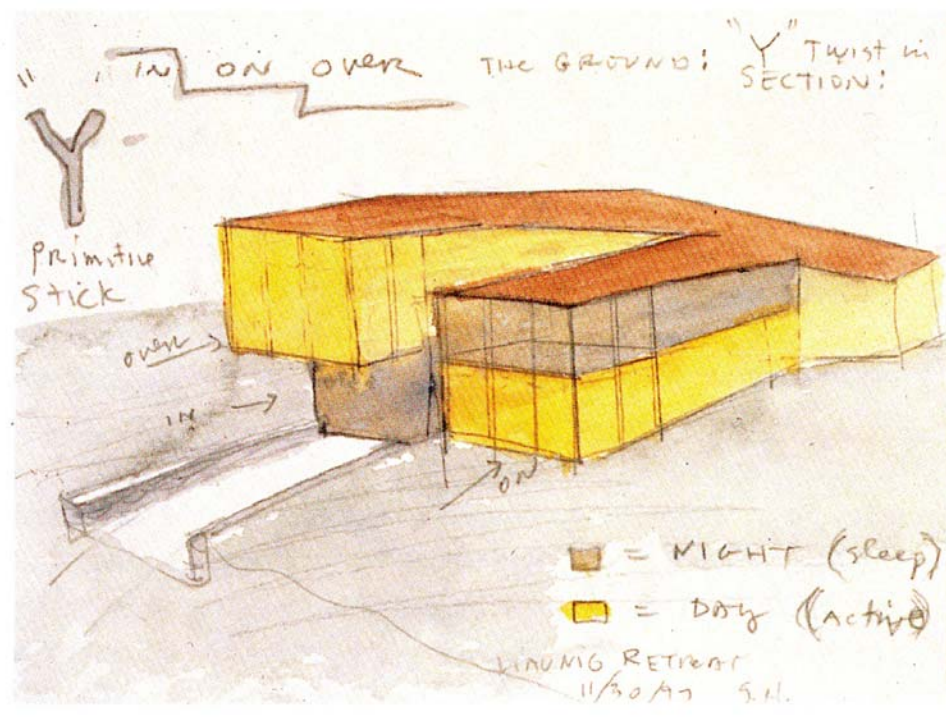
*"We **made ... concept drawings** and perspectives, **then we found** the tectonics of the curved steel truss"*

Steven Holl's Reasoning with Sketches

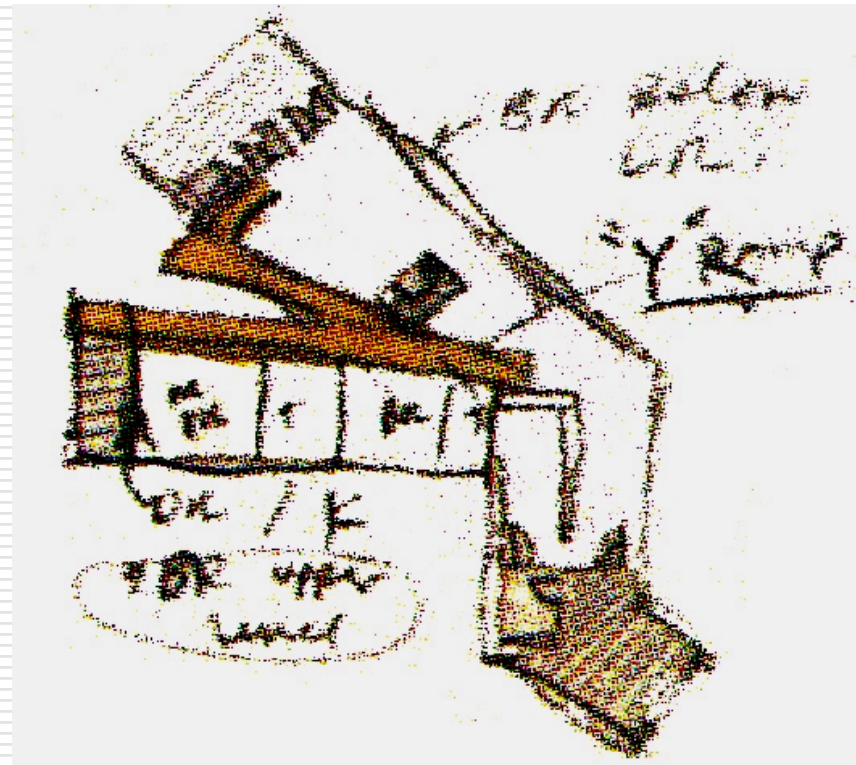
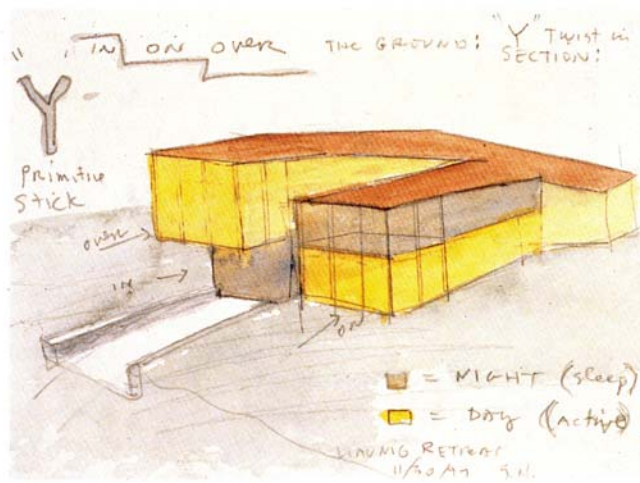
□ Visual Symbols - Spaces and Text Labels



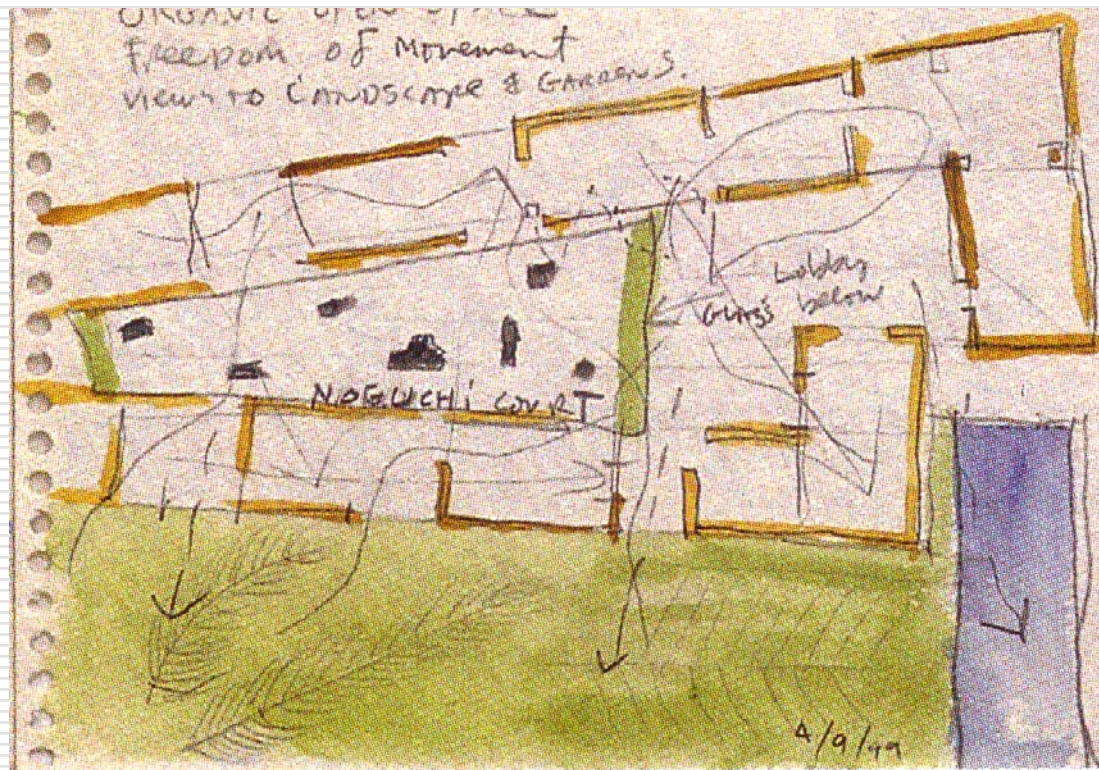
□ Spatial Concerns



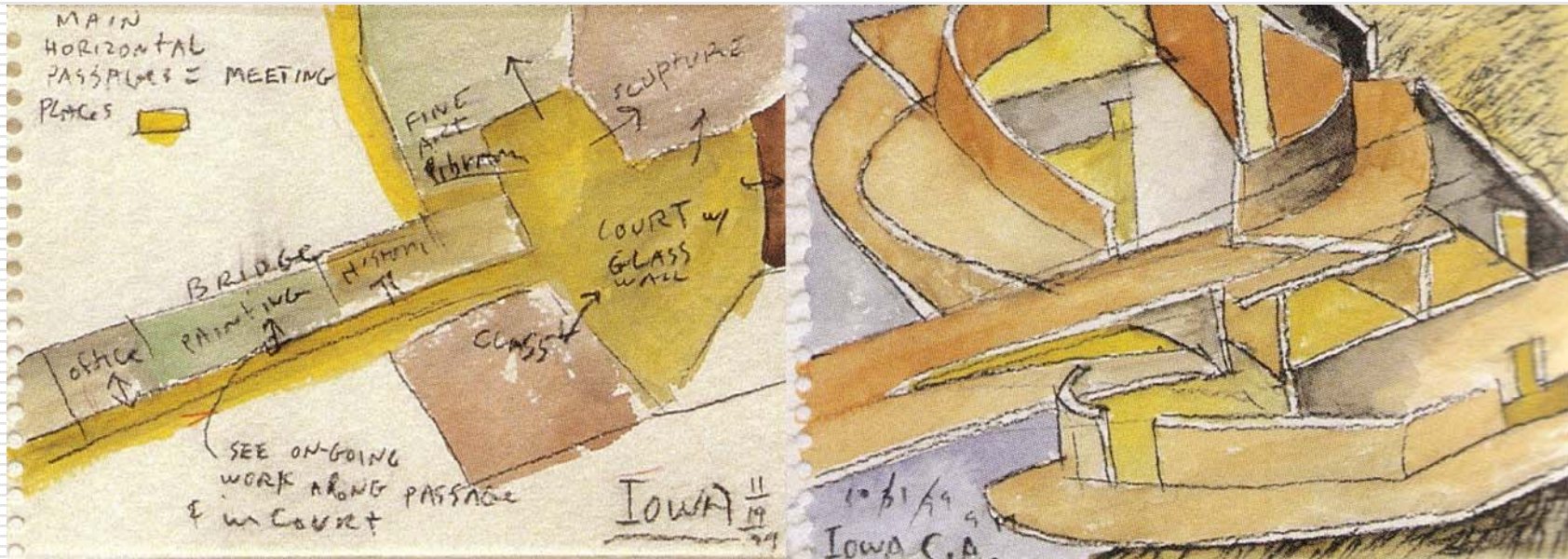
□ Functional Concerns



□ Functional Concerns



3D Visualization



Studio Critiques and Reasoning

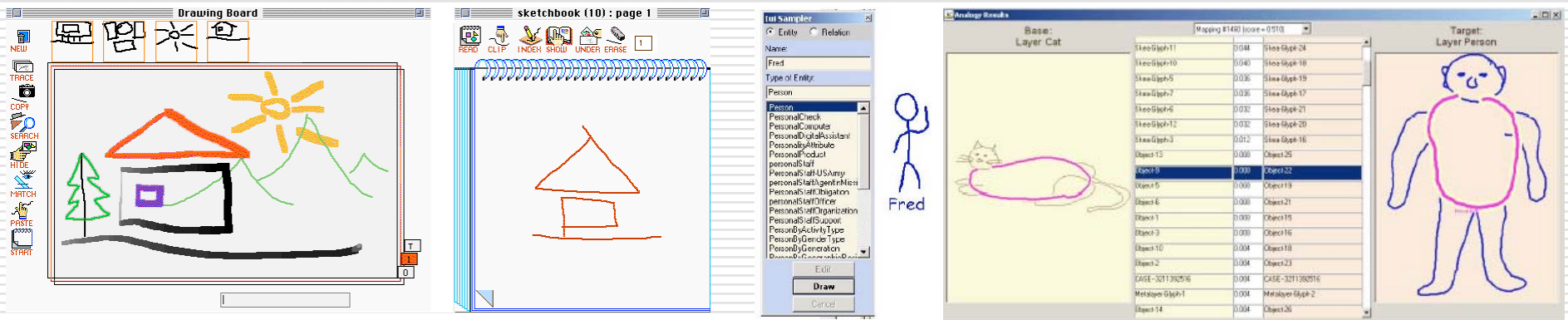
- Desk Crits
 - : Reviewers (reframe design problem)
 - : Student (transfer/ restructure)



Related Work – Spatial Reasoning

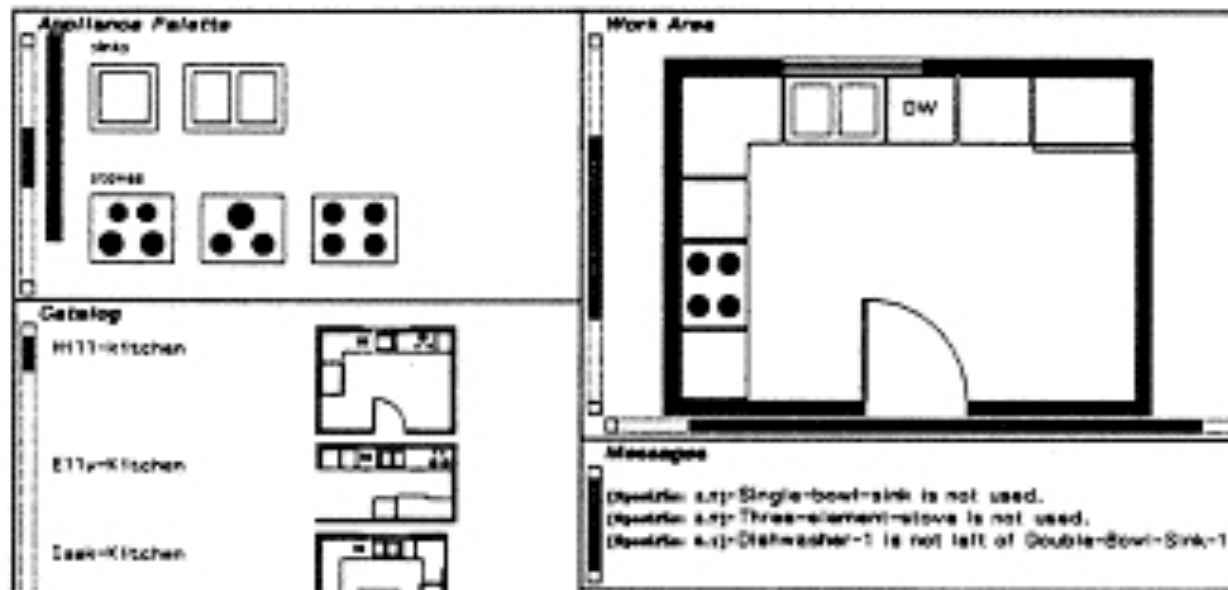
□ Electronic Cocktail Napkin

□ sKEA (Sketching Knowledge Entry Associate)



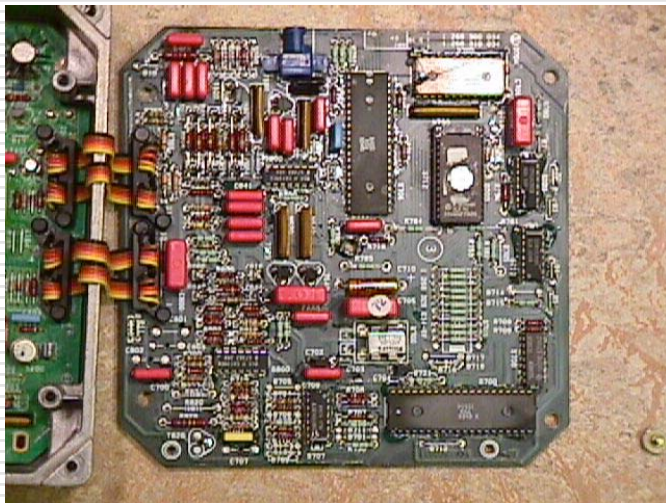
Related Work – Critiquing

- ❑ KID (Knowing-in-Design)
CRACK (A Critiquing Approach to Cooperative Kitchen Design)

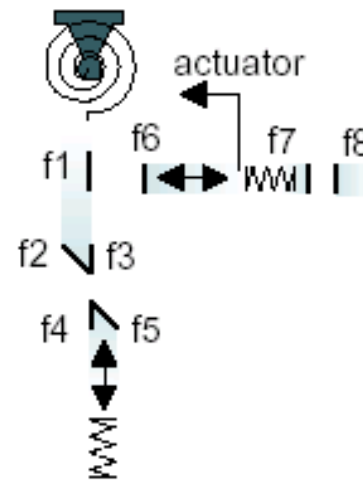


Related Work – Functional Critiquing

□ Critter



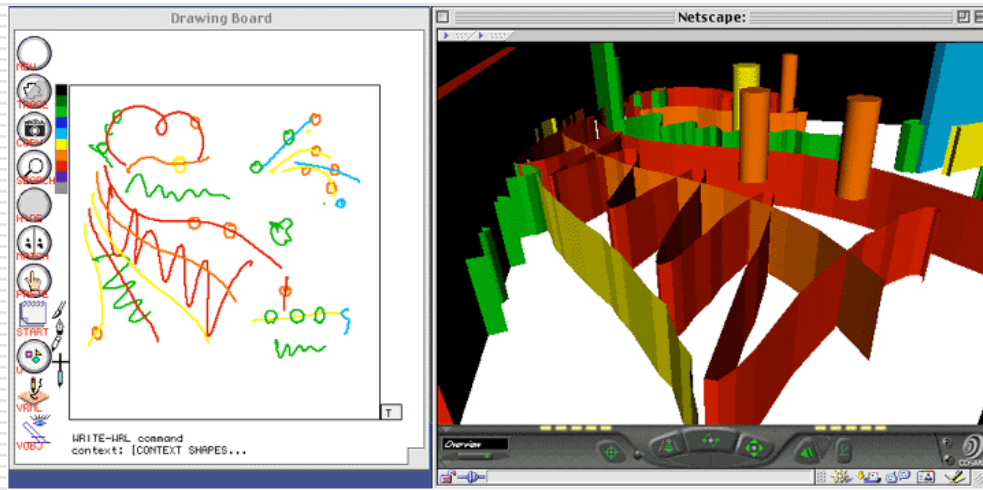
□ SketchIT



engagement pairs:	
f1 - f6	(push-pair)
f2 - f5	(cam-follower)
f3 - f4	(lever-stop)
f7 - f8	(pushrod-stop)

Related Work – 3D Visualization

□ Sketch VR



□ Teddy

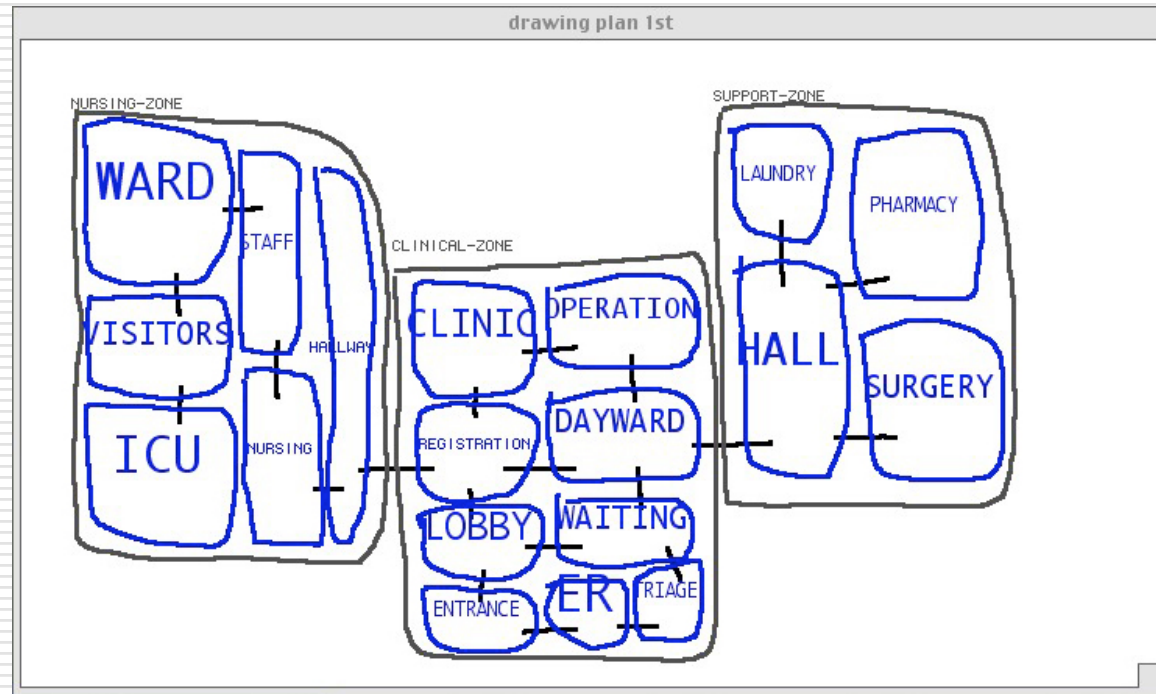


Related Work

Design Evaluator

: Hospital Floor Plan

- Computational sketching environment



Design Evaluator

: Hospital Floor Plan

□ Predefined Predicates (Path Rules + Zone Rules)

-Room Sequence Rule

(MUST-PASS-THROUGH ENTRANCE TRIAGE ER)

-Adjacency Rule

(SHOULD-BE-ADJACENT ER ICU)

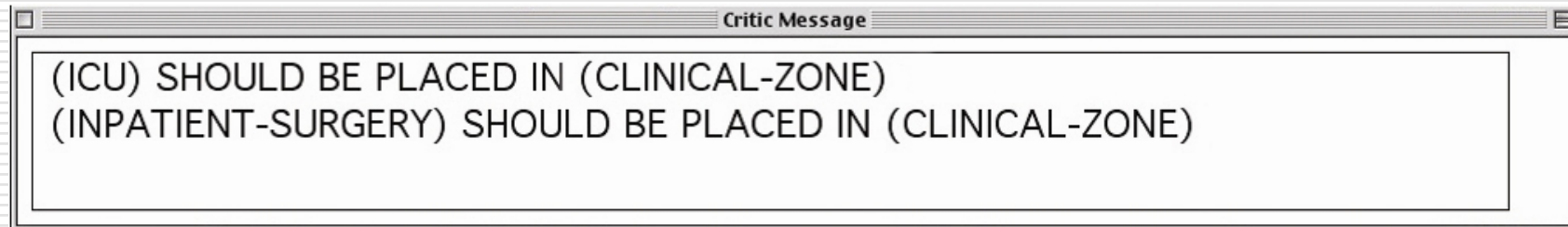
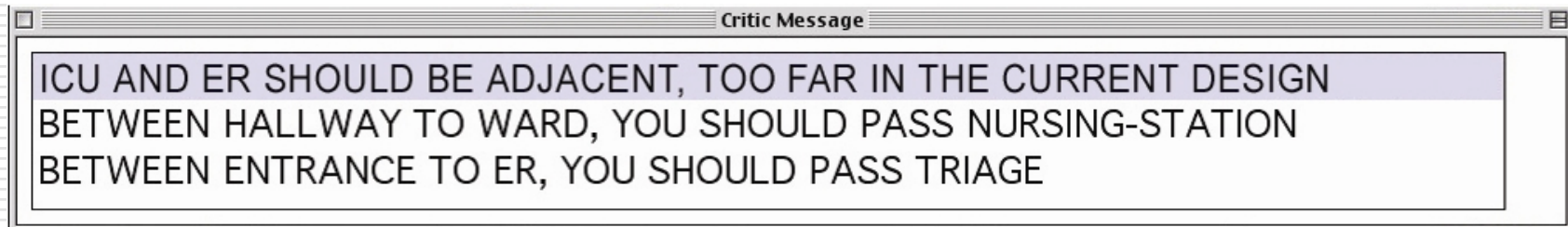
-Room Placements Rule

(MUST-BE-IN CLINICAL-ZONE (ER TRIAGE CLINIC DAYWARD...))

Design Evaluator

: Hospital Floor Plan

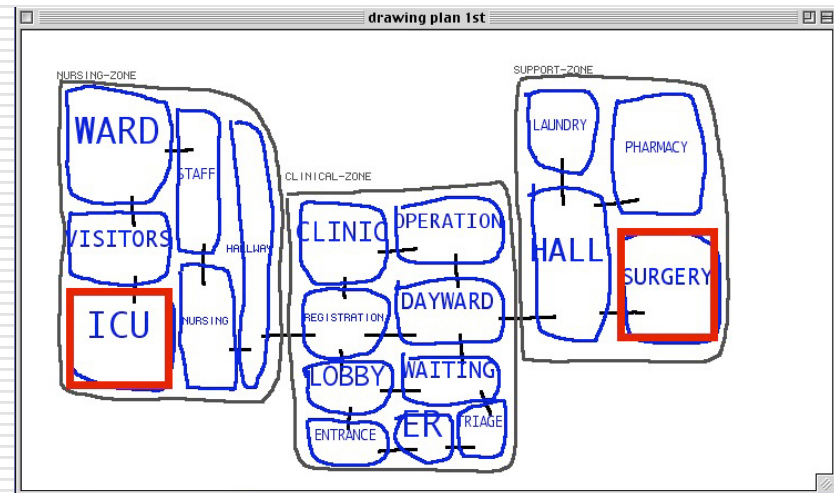
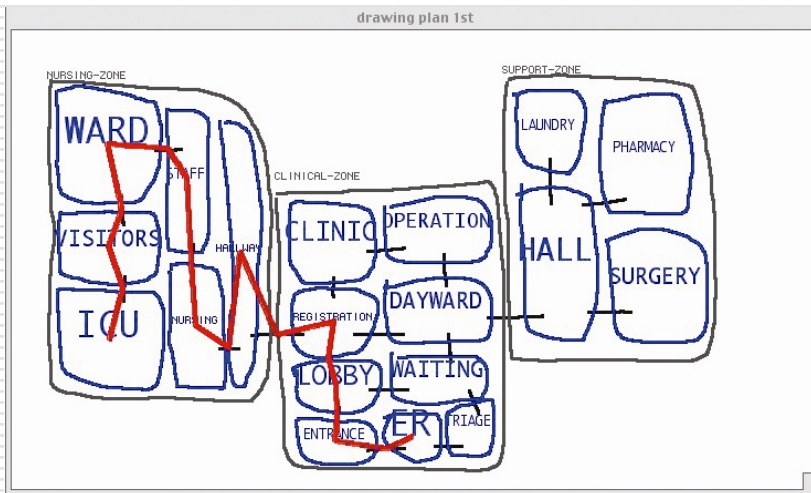
❑ Displaying Critiques – Textual Feedback



Design Evaluator

: Hospital Floor Plan

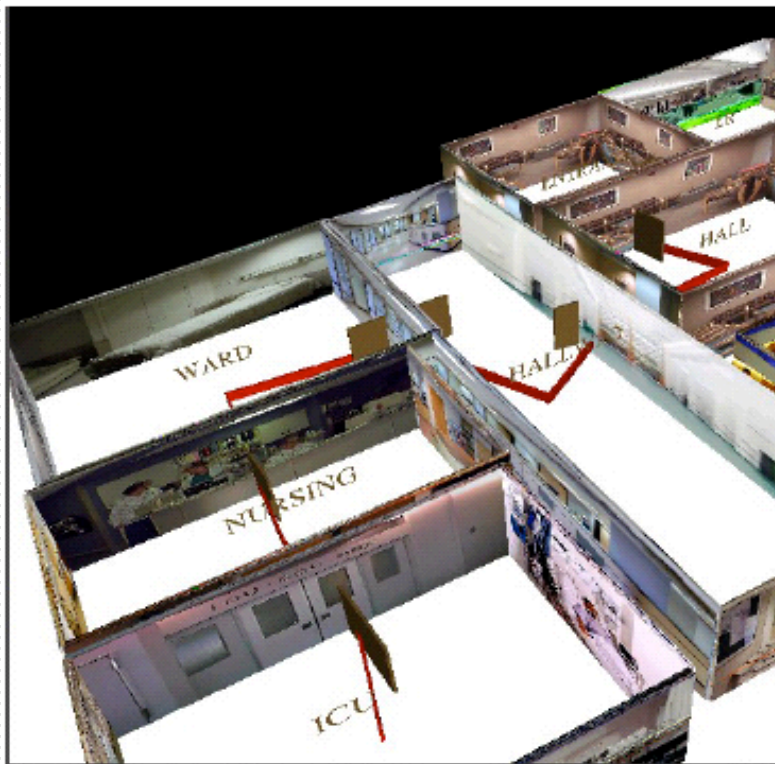
□ Displaying Critiques – Visual Feedback



Design Evaluator

: Hospital Floor Plan

- Displaying Critiques – 3D Visualization



Discussion

- Architect's reasoning with drawings
 - Design Evaluator- Sketch-based critiquing
 - : predefined predicates as knowledge
 - : text & visual critiques, 3D visualization
 - design critiques
 - : provide missing information
 - : trigger new alternatives
 - : reason with drawing about overlooked issue
-

Critiquing Freehand Sketch : Design Evaluator

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