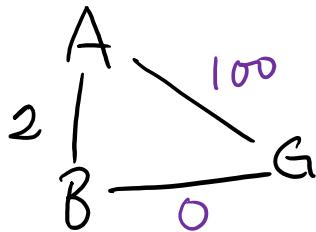


Δ INEQUALITY



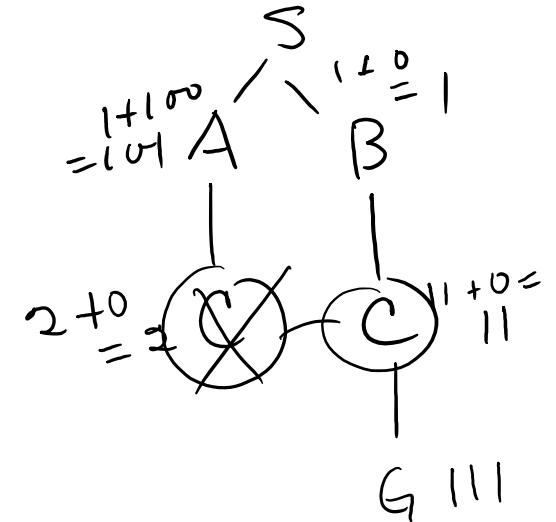
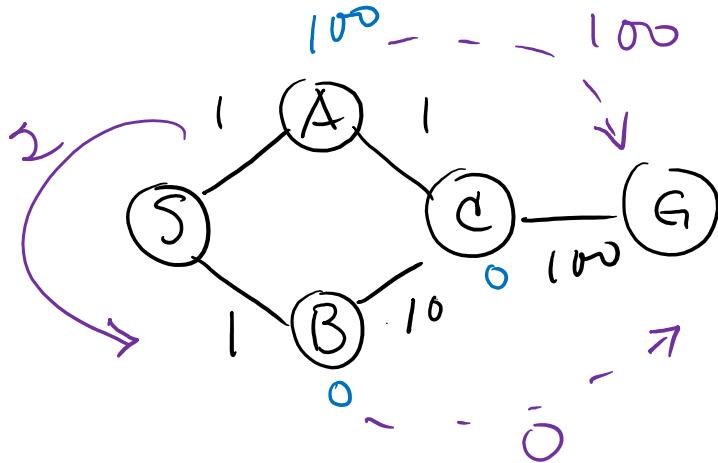
$$D(A, B) + H(B, G) \geq H(A, G)$$

$$2 + 0 \neq 100$$

$$\text{IF } H(B, G) = 0, 0 \leq H(A, G) \leq 2$$

$$\text{IF } H(A, G) = 100, 98 \leq H(B, G) \leq 110$$

CONSISTENT

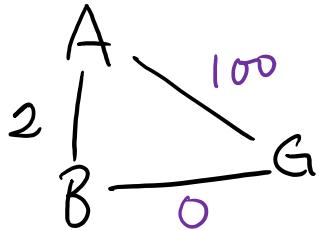


NOT THE
SHORTEST!

ADMISSIBLE? $H(A, G) < 101$ ✓

$$H(B, G) \leq 110$$

Δ INEQUALITY



$$D(A, B) + H(B, G) \geq H(A, G)$$

$$2 + 0 \not\geq 100$$

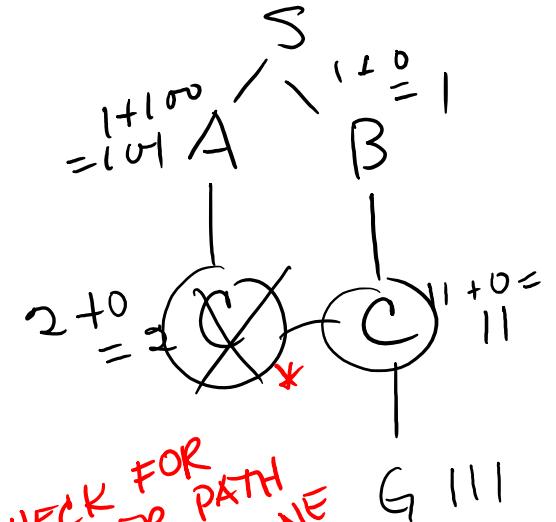
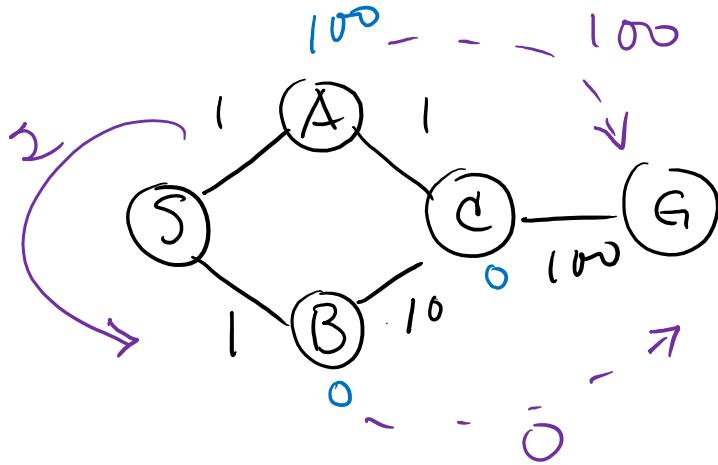
IF $H(B, G) = 0$, $0 \leq H(A, G) \leq 2$

ADMISSIBLE? $H(A, G) < 101$ ✓

IF $H(A, G) = 100$, $98 \leq H(B, G) \leq 110$

$$H(B, G) \leq 110$$

CONSISTENT



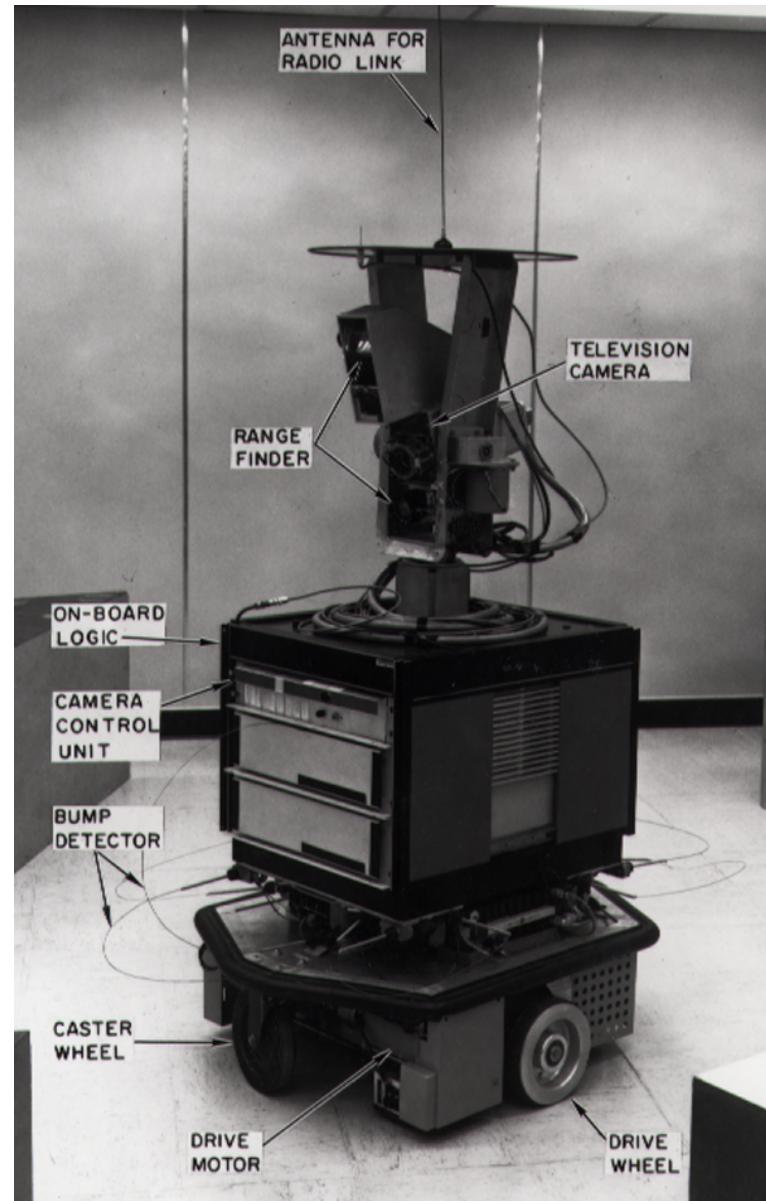
*CHECK FOR
SHORTER PATH
BEFORE PRUNE

NOT THE
SHORTEST!

Oracle, *The Matrix*



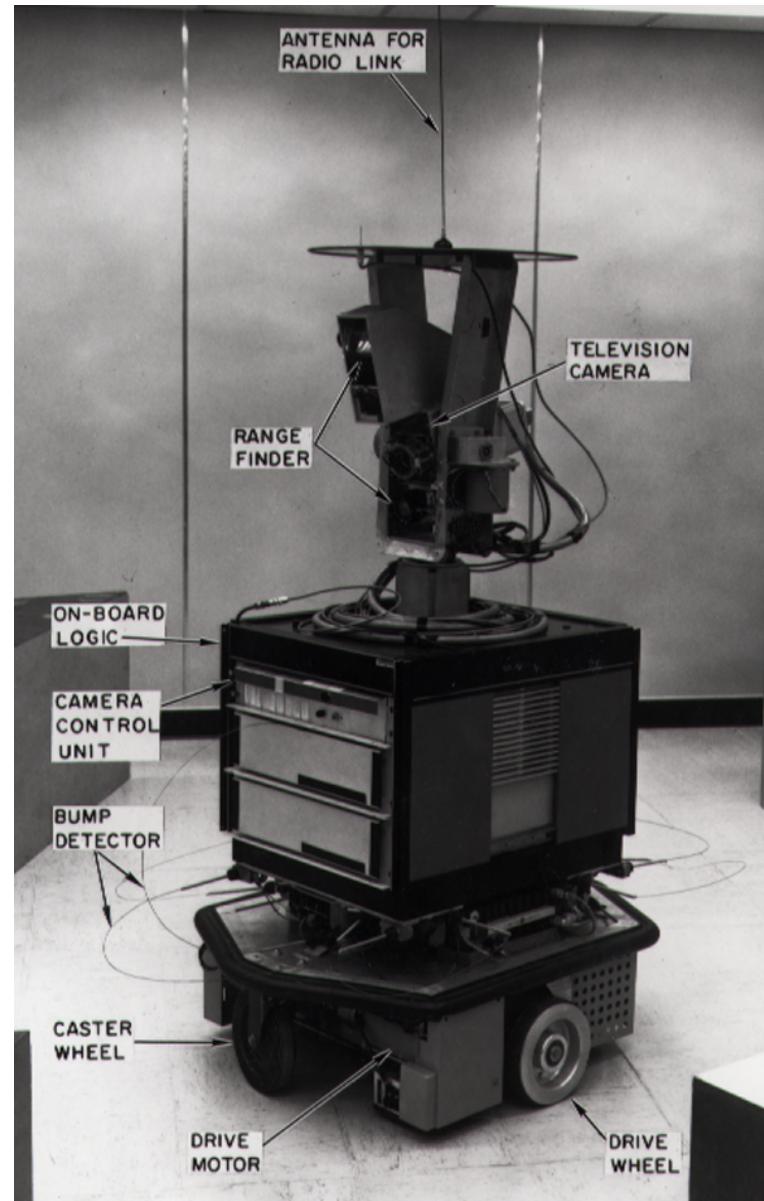
Shakey



Oracle, *The Matrix*



Shakey



The Architect's Collaborator:

Informed Search Using a Mapping of Abstract Qualities to Physical Form



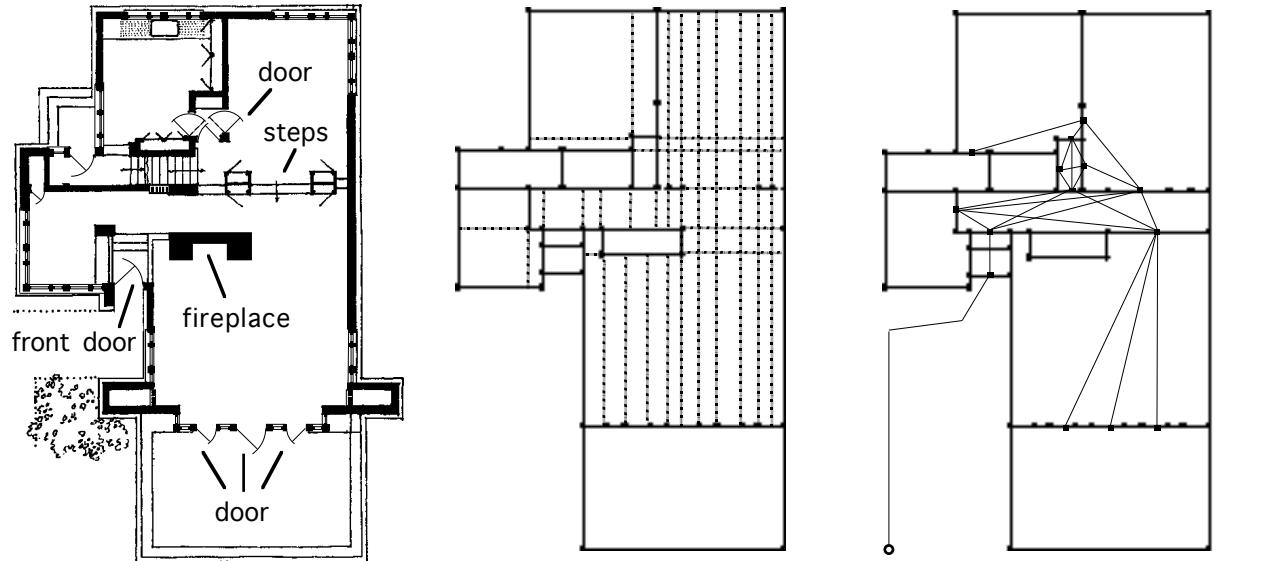
See extra slides.

Kimberle Koile, MIT CS and AI Lab, MIT

Design Representation



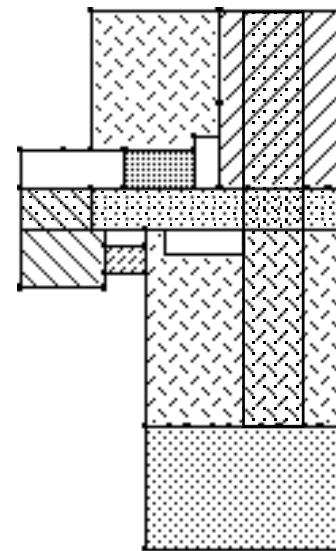
Mrs. Thomas Gale House
Oak Park, Illinois



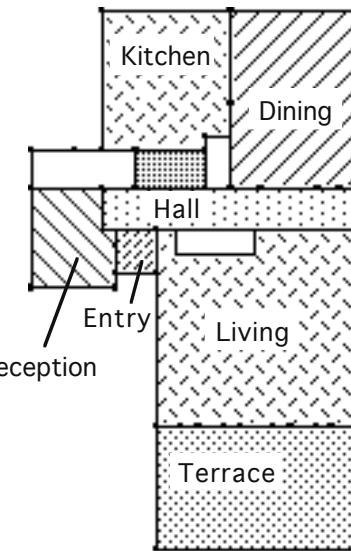
Design elements

Edges

Circulation

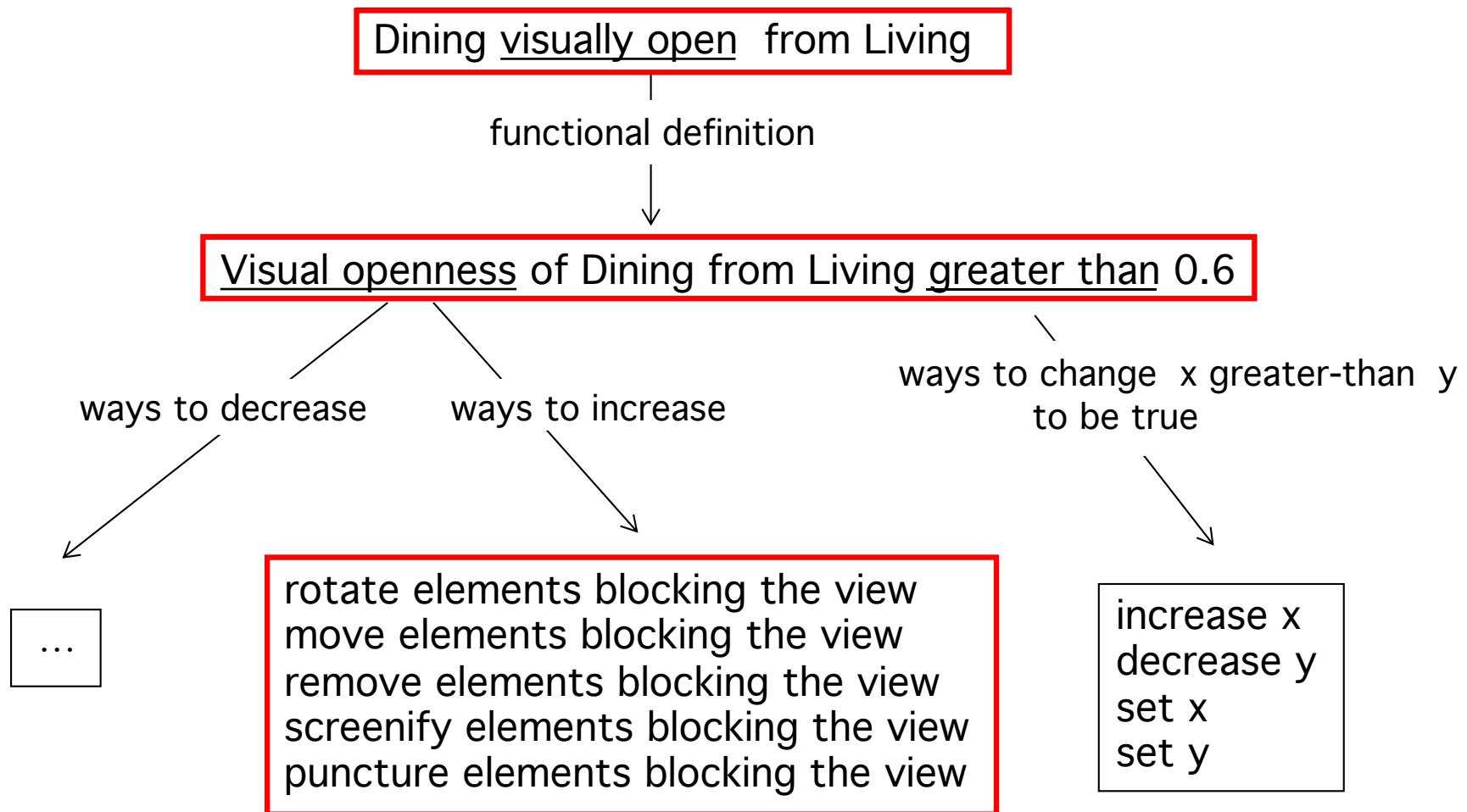


Territories

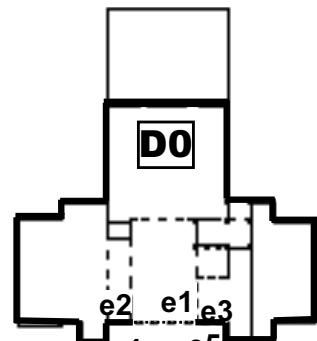


Use spaces

Mapping of abstract terms to physical form



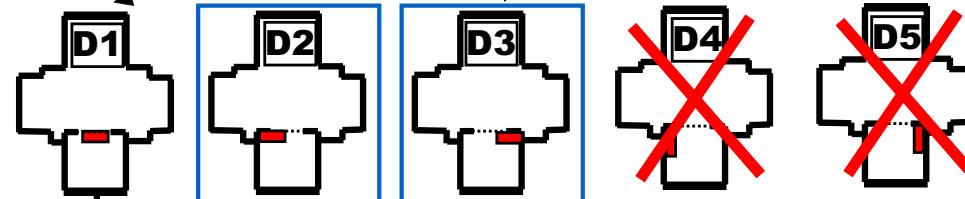
Given design D0 = Horner



(visible-center Living from Dining)
(visually-open Living from Dining)
(fireplace-count in Living) = 1
(fireplace-count in Horner) = 1
(fireplace-on-interior-edge Living)

fireplace-on-interior-edge

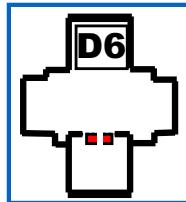
s1 s2 s3 s4 s5 s6 add fireplace



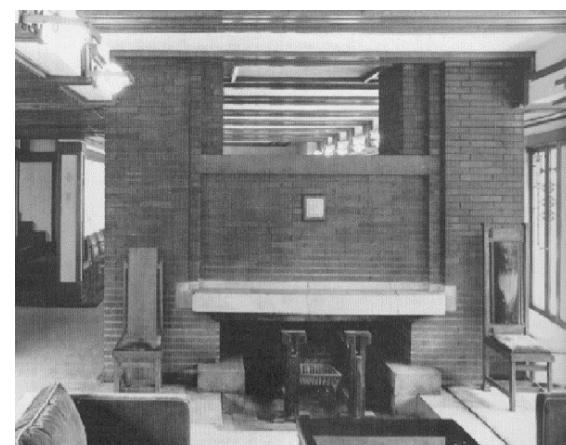
visible-center

s7 puncture fireplace

s8 remove fireplace



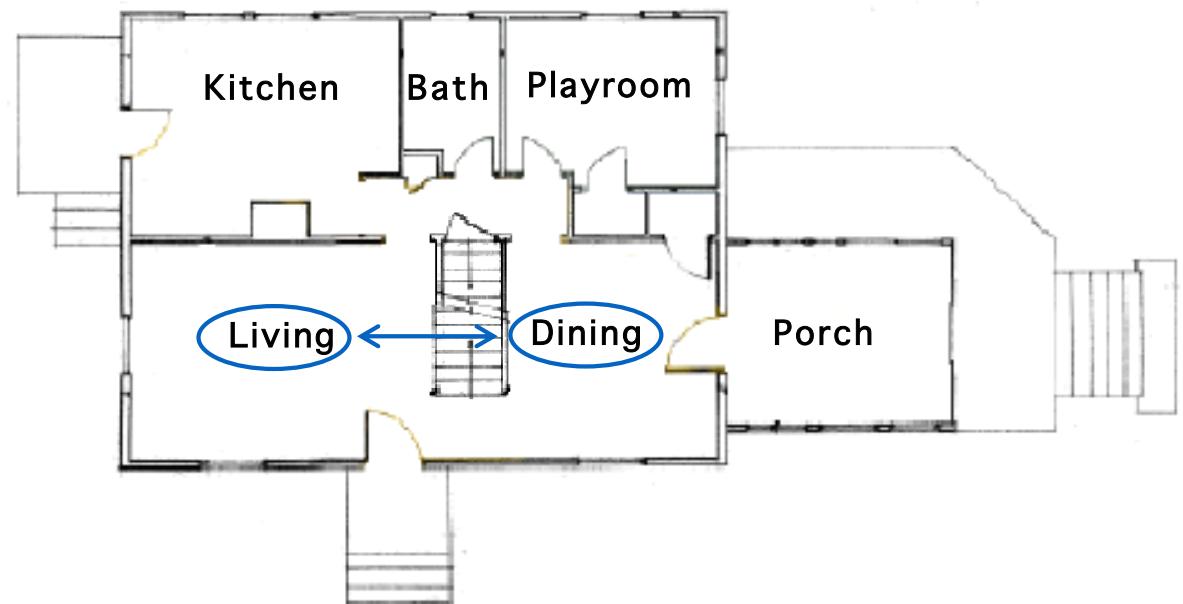
visually-open





Real World Example

Chatham house
Arlington, MA

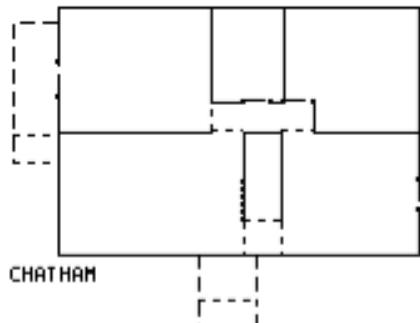


Goal: Dining visually open from Living

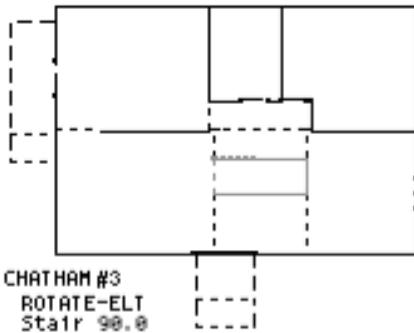


Chatham house view from Living to Dining

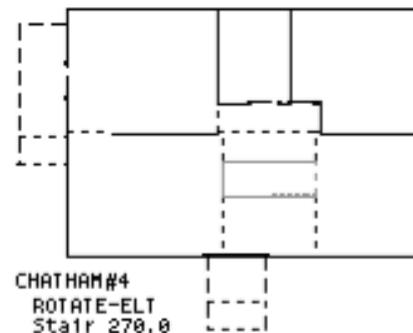
Solutions



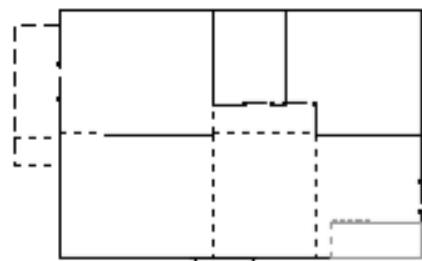
CHATHAM



CHATHAM #3
ROTATE-ELT
Stair 90.0



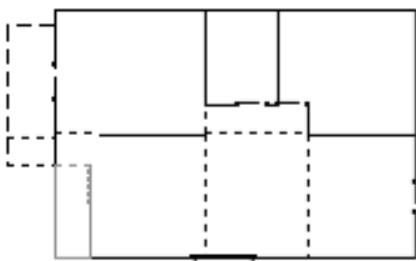
CHATHAM #4
ROTATE-ELT
Stair 270.0



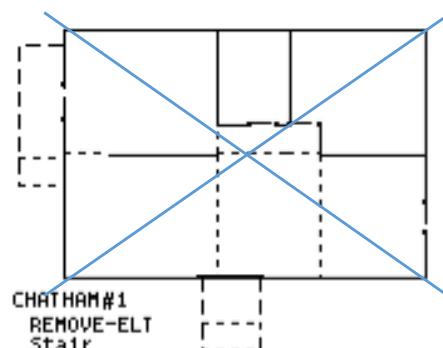
CHATHAM #5
MOVE-TO-EDGE
Stair
(42.1 38.9)(34.0 38.9)



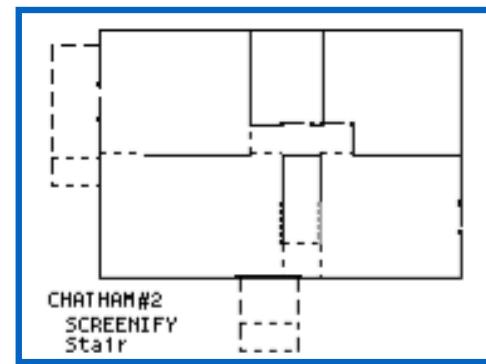
CHATHAM #6
MOVE-TO-EDGE
Stair
(18.2 38.9)(10.1 38.9)



CHATHAM #7
MOVE-TO-EDGE
Stair
(10.1 38.9)(10.1 22.9)

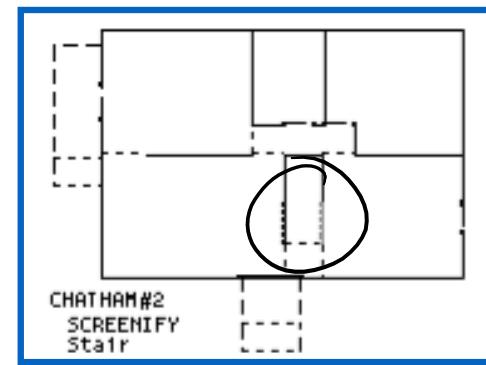
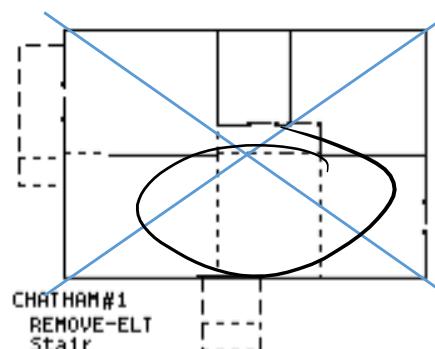
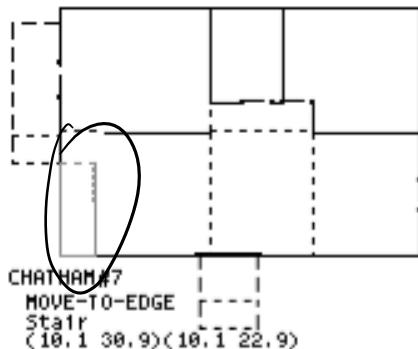
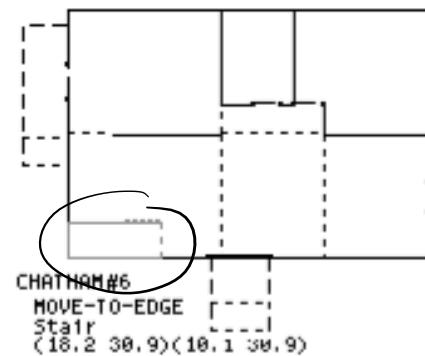
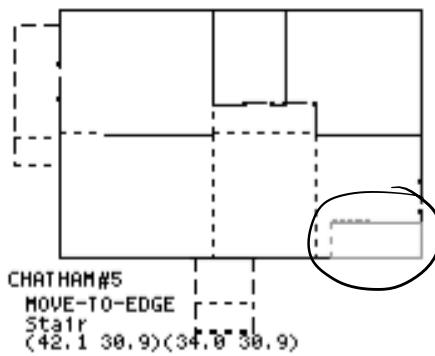
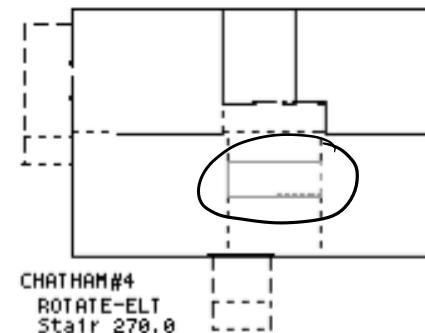
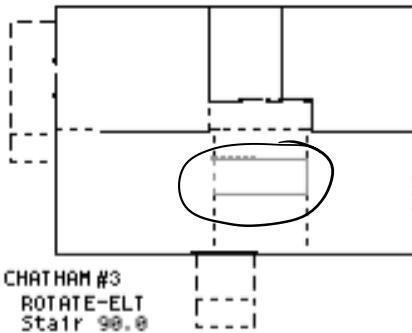
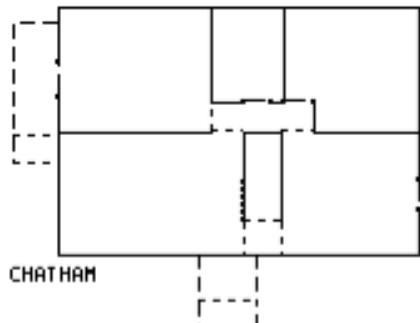


CHATHAM #1
REMOVE-ELT
Stair



CHATHAM #2
SCREENIFY
Stair

Solutions



Implemented Solution



After addition of screen: View from Living to Dining

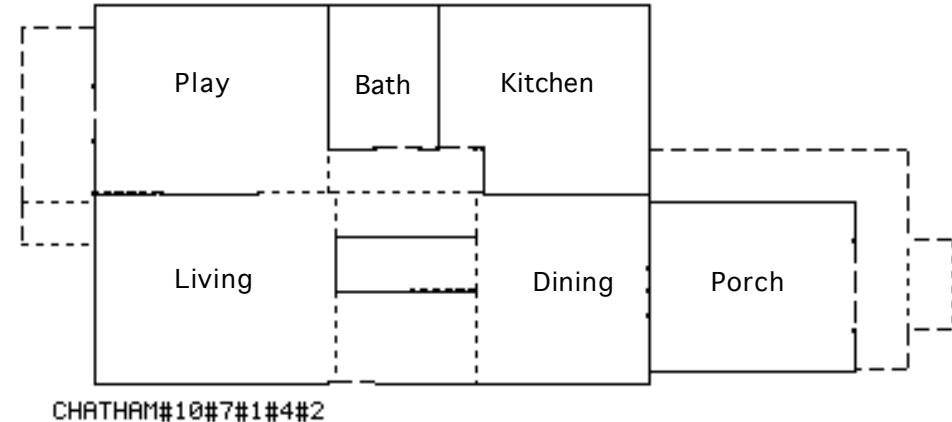
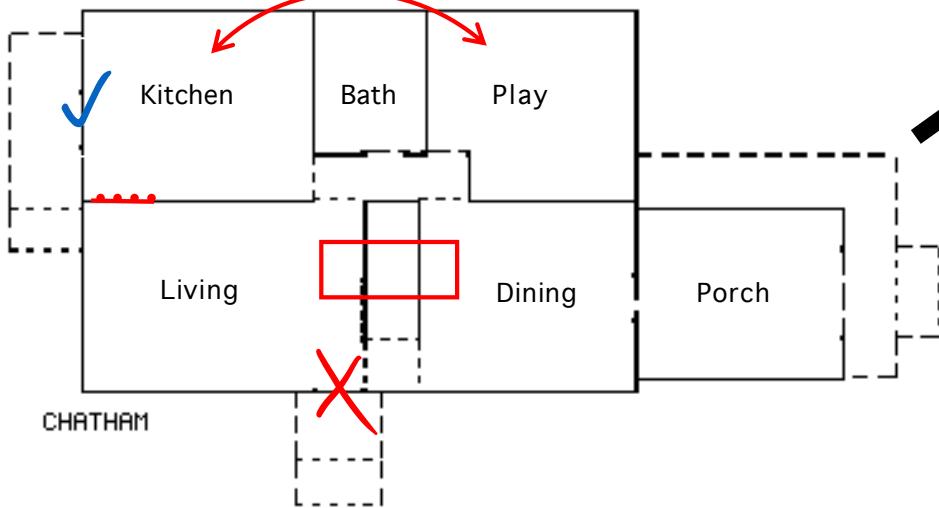


After addition of screen: View from Dining to Living

Real-World Example: Multiple Goals

- Design problem = Chatham house + 4 goals
 - Goal 1: One perceived main entry
 - Goal 2: Dining visually open from Living
 - Goal 3: Living semi-private with respect to main entry
 - Goal 4: Kitchen adjacent to Dining
- Some of TAC's designs are similar, some different.

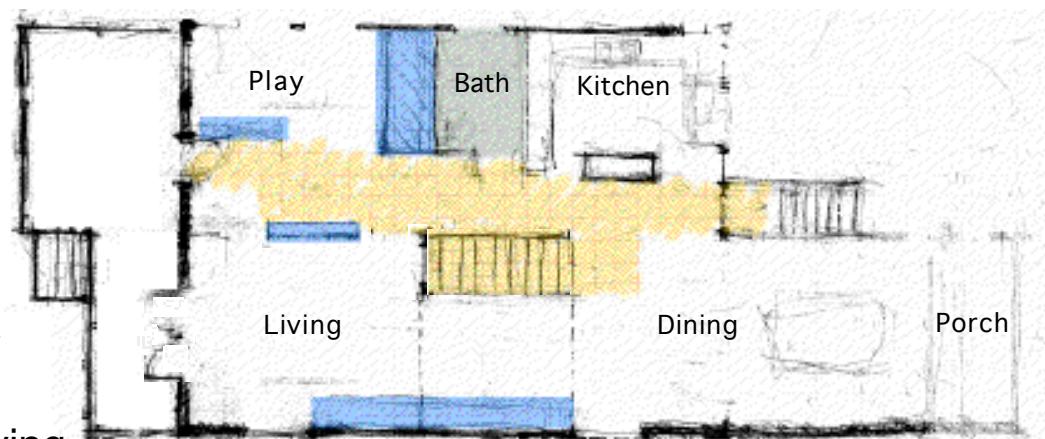
Similar designs



TAC

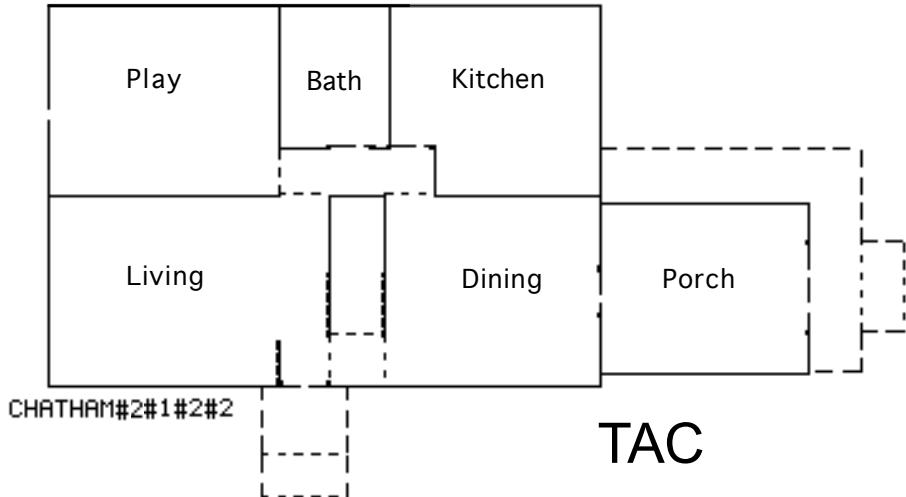
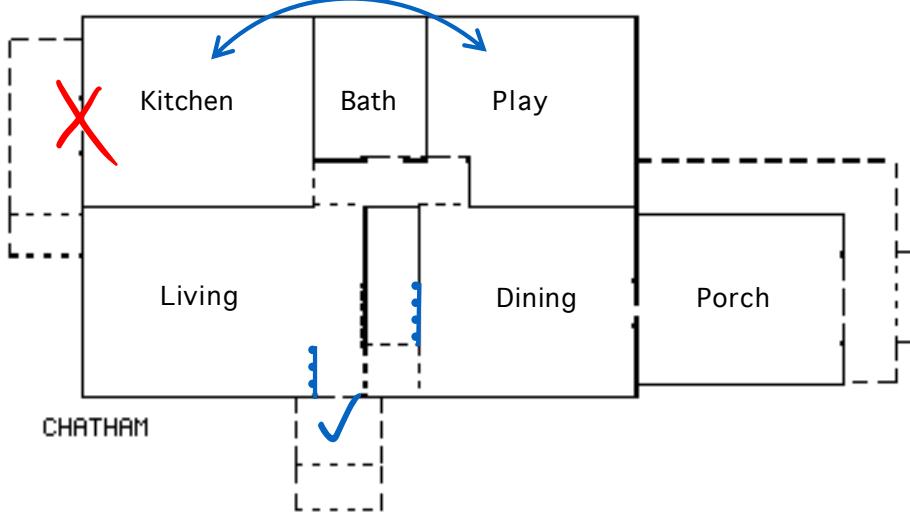
TAC and Architects:

- » removed front door, side door is new front door
- » turned stair
- » opened up wall between new front door and Living
- » exchanged Kitchen and Play



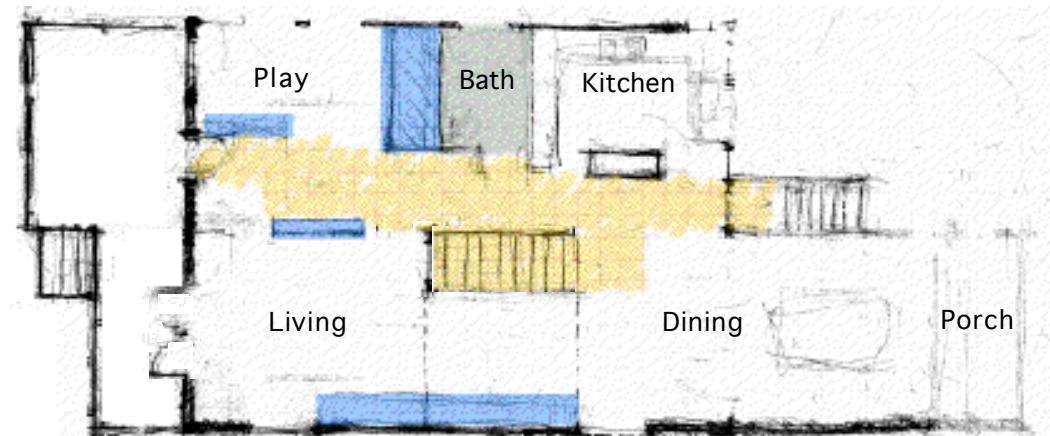
Architects

Different designs



TAC:

- » removed side door, kept front door
- » replaced stair wall with screen
- » added screen between front door and Living
- » exchanged Kitchen and Play



Architects