

DAYS OF FUTURE PAST

horizons and history

Scott Klemmer and Michael Bernstein

CS 147

Where is HCl going?

Ubiquitous computing

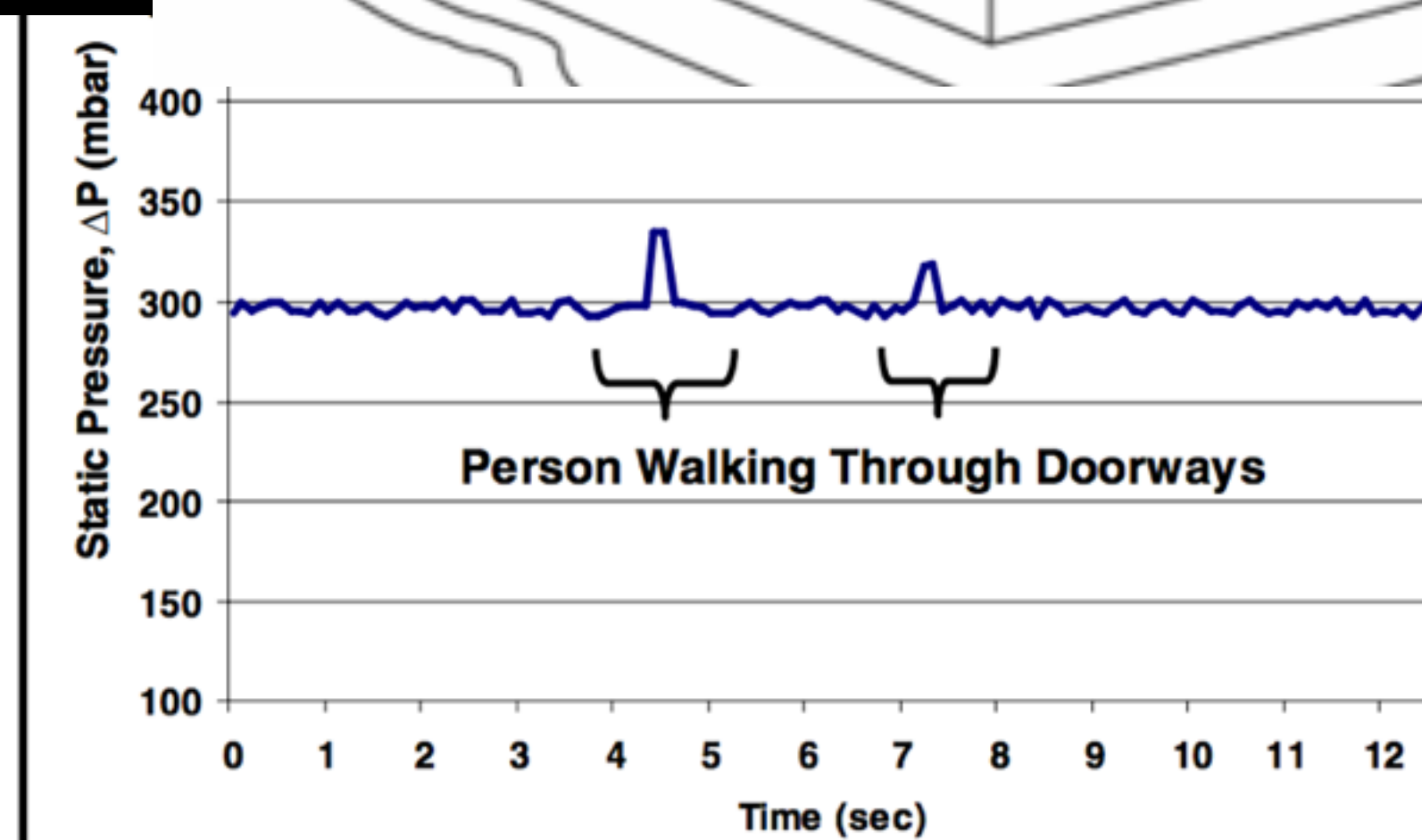
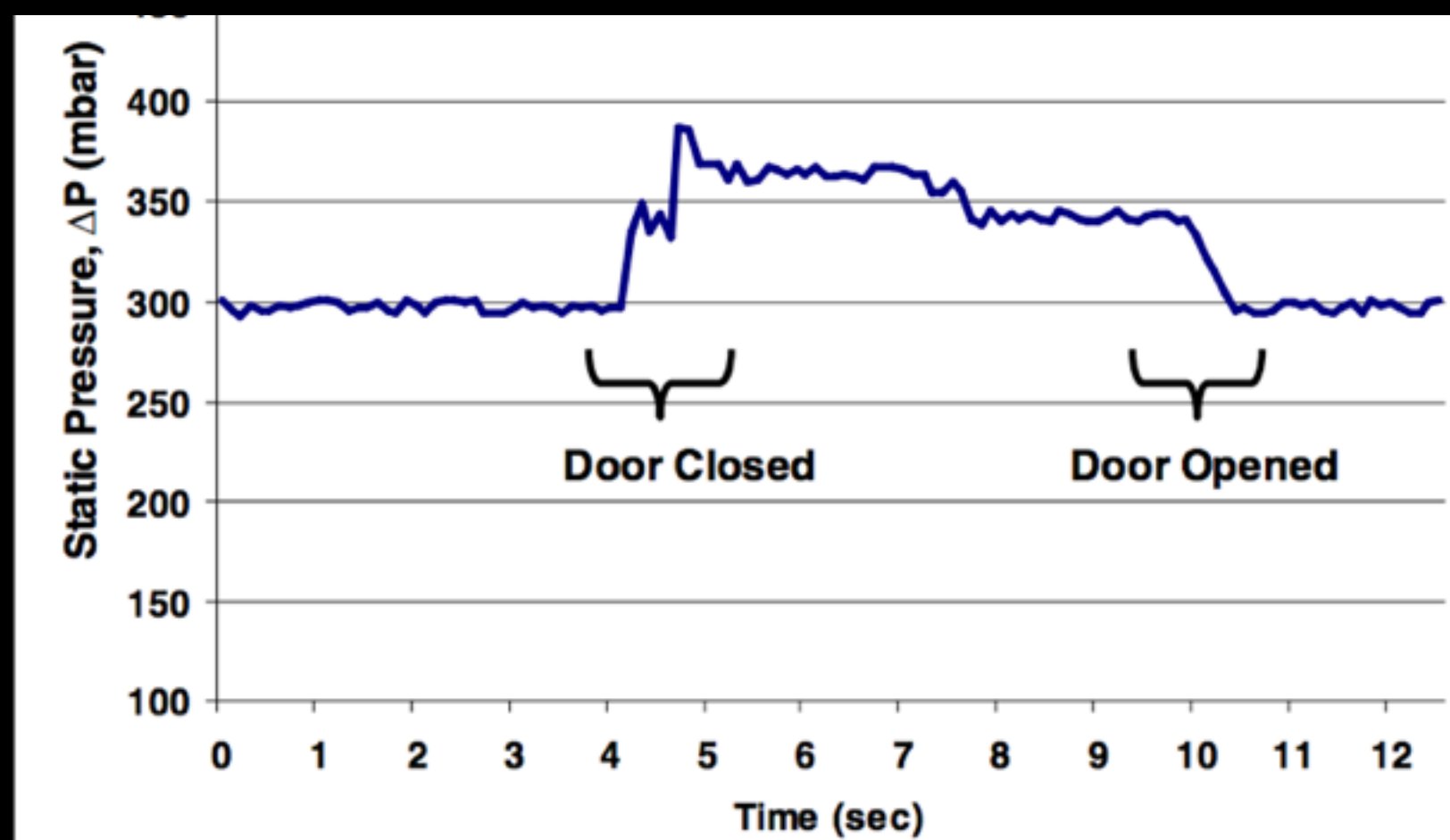
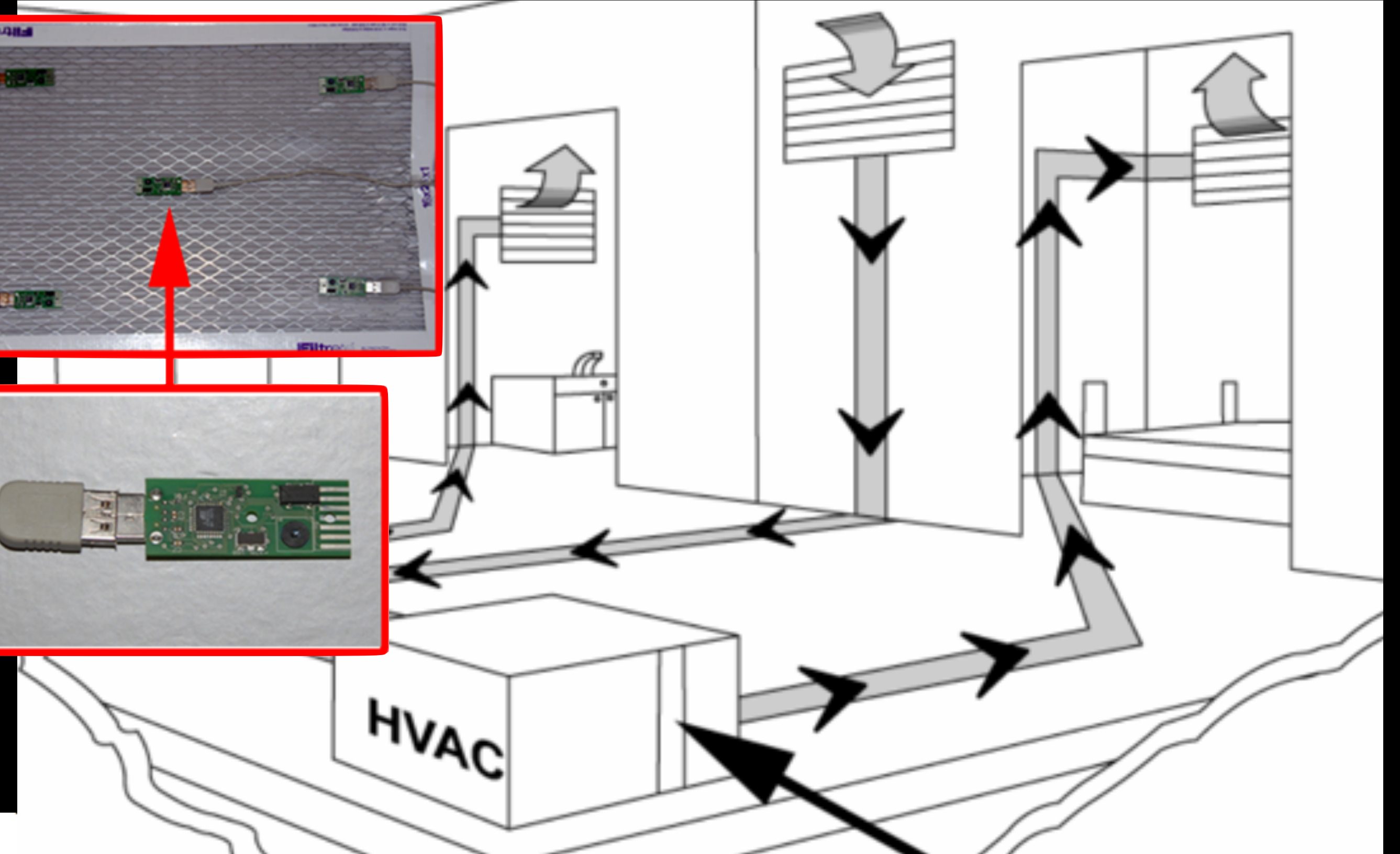
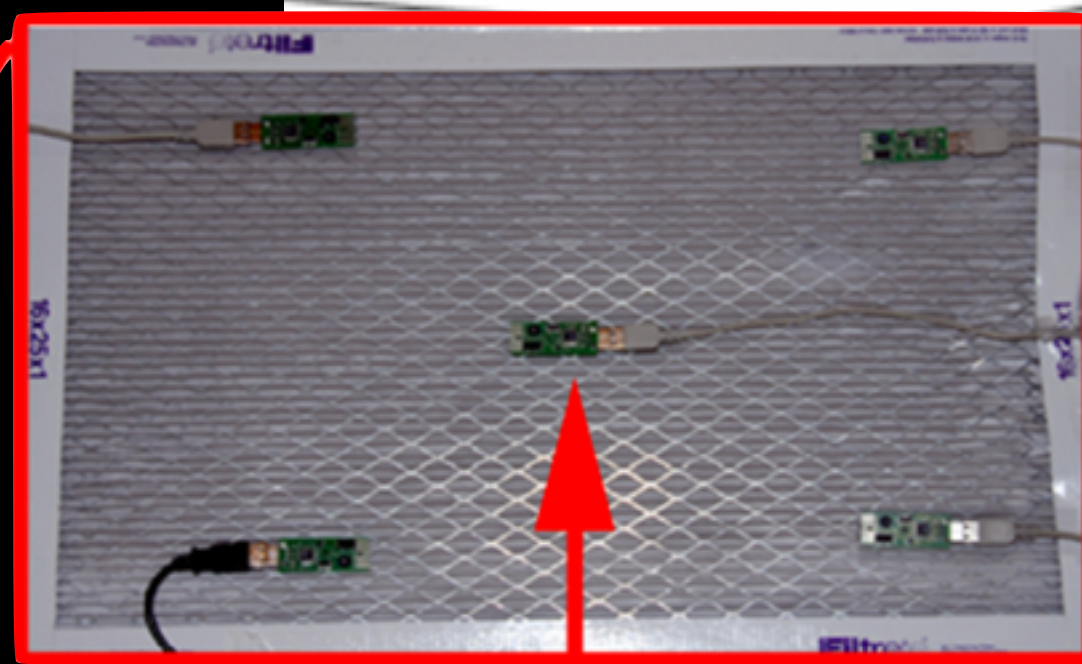
When computing is everywhere...

Computers will ‘vanish into the background’,
weaving ‘themselves into the fabric of everyday life
until they are indistinguishable from it.’

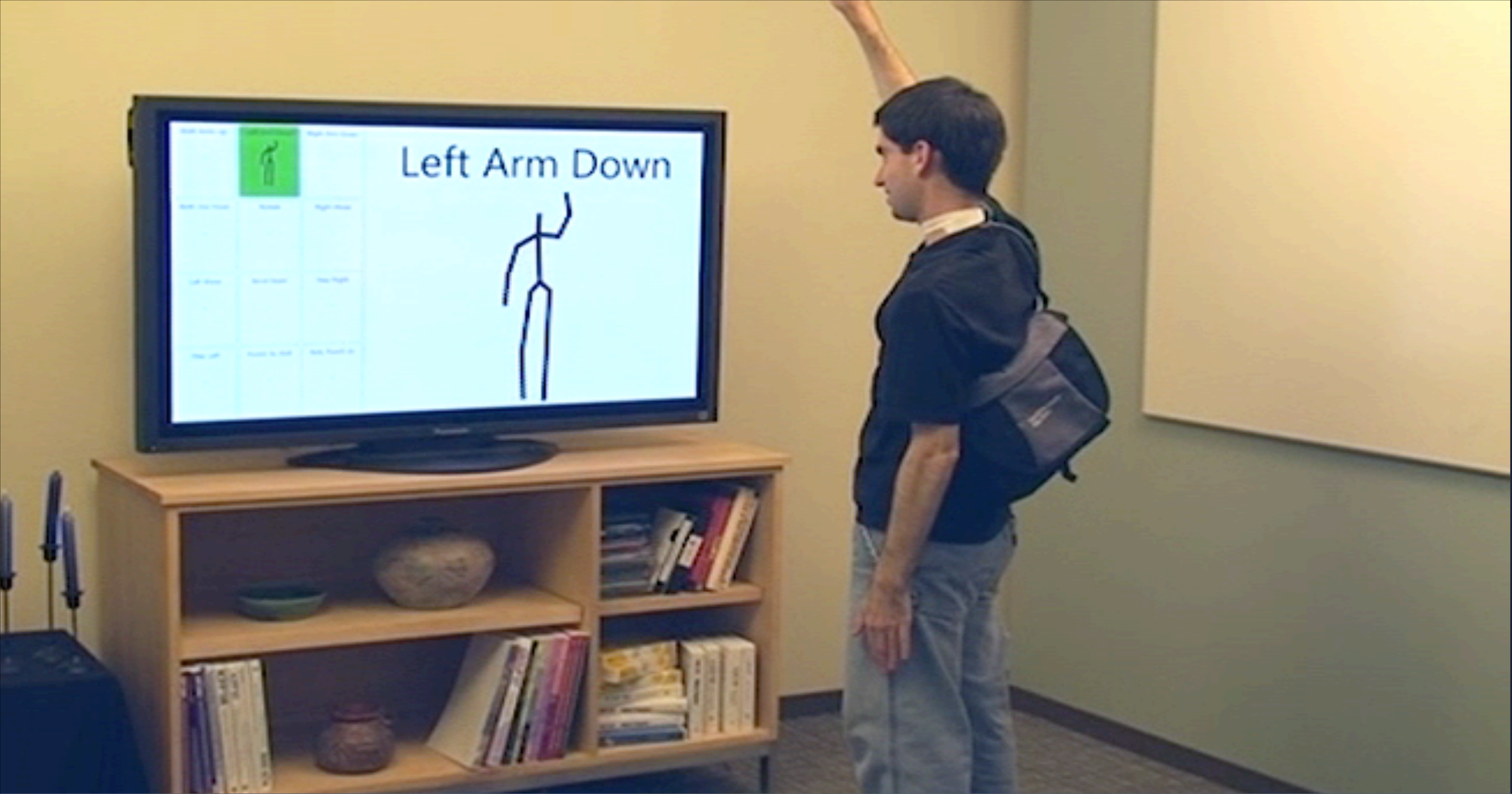
quotes from Daniel Fallman’s reading of “The Computer for the 21st Century”



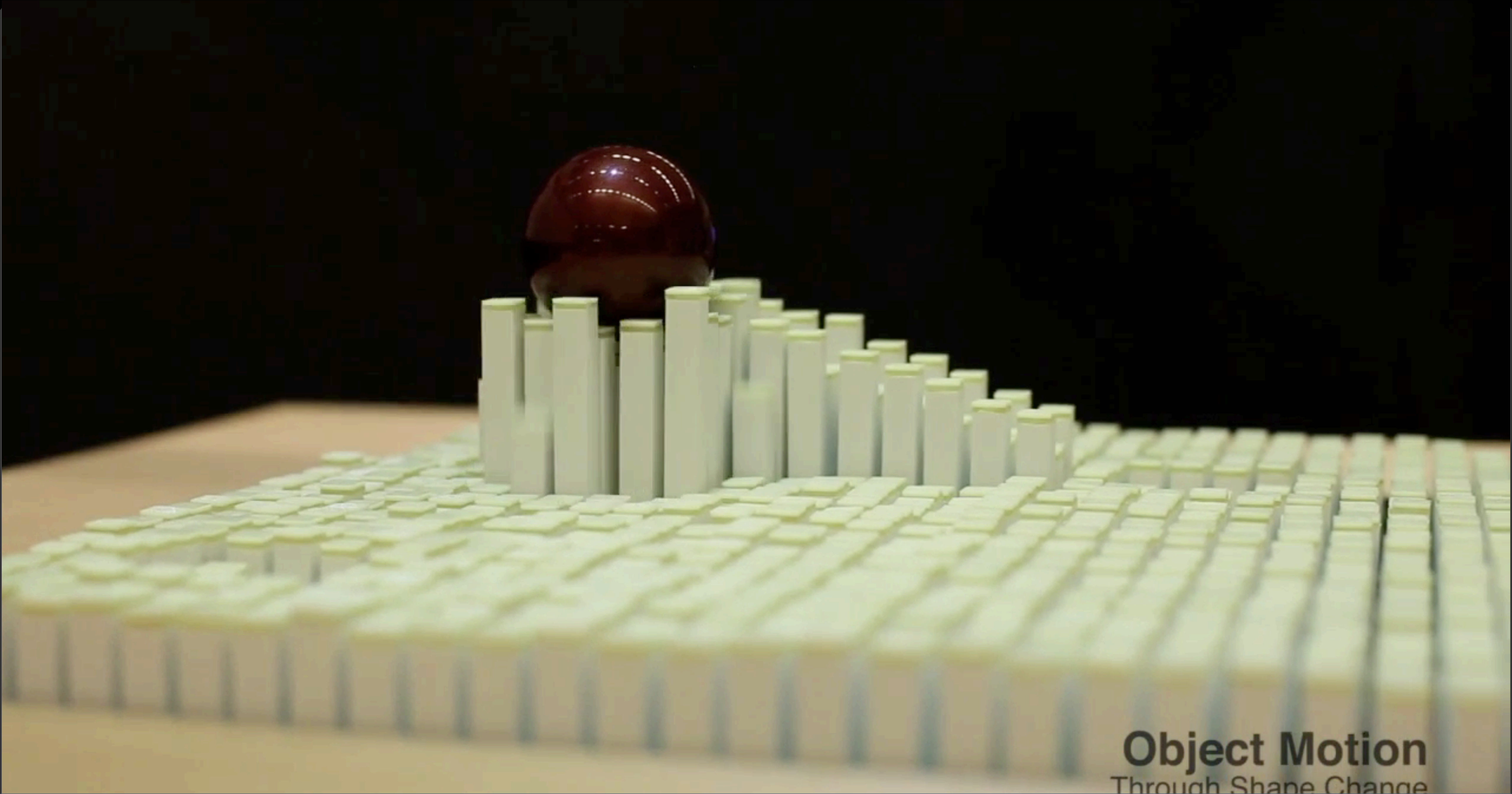
Harrison, Morris, Tan. Skinput: Appropriating the Body as an Input Surface. CHI '10.



Patel, Reynolds, Abowd. Detecting Human Movement by Differential Air Pressure Sensing in HVAC System Ductwork. Pervasive '08.



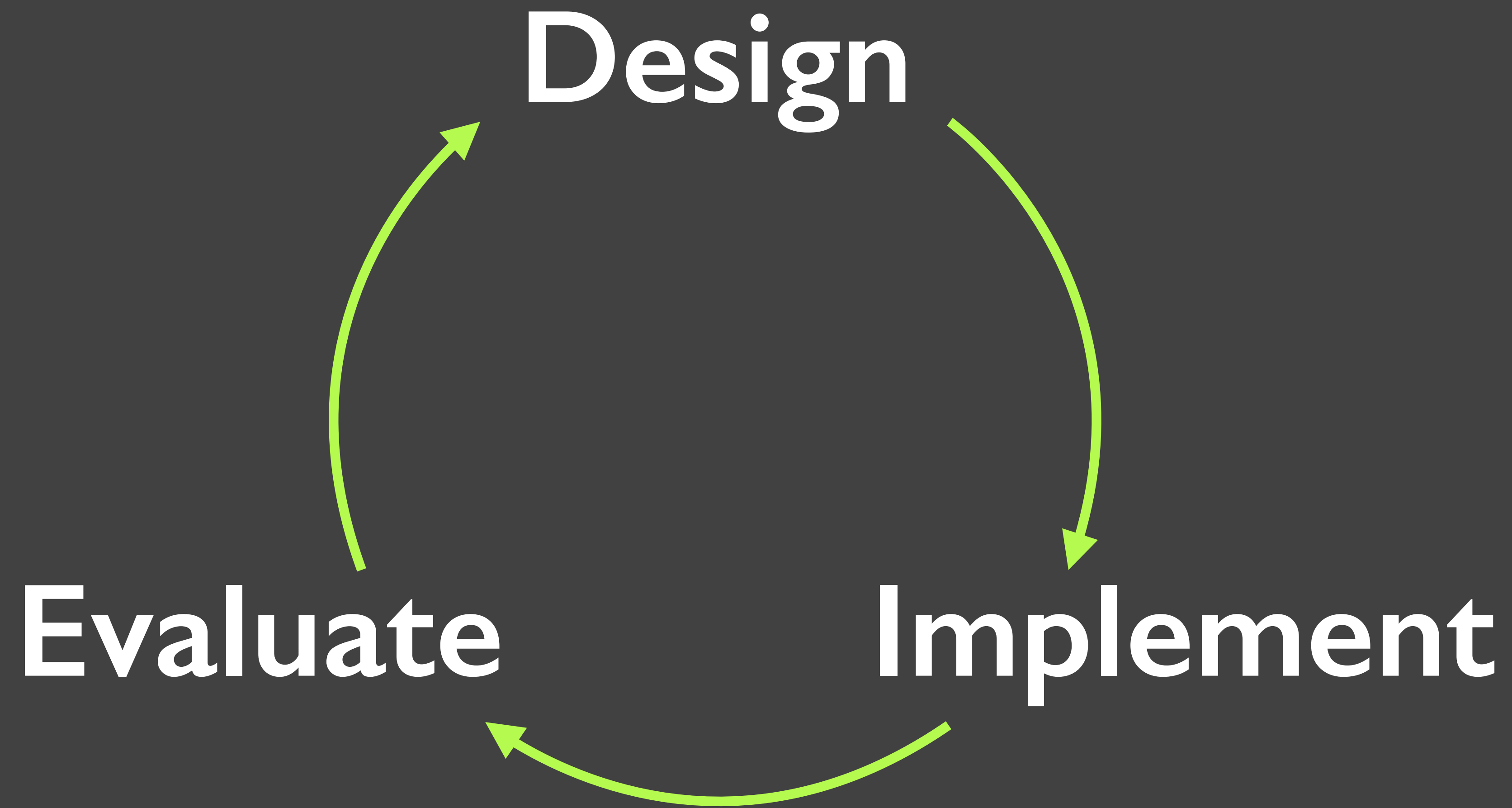
Cohn, Morris, Patel, Tan. Your Noise is My Command: Sensing Gestures Using the Body as an Antenna. CHI '11.



Object Motion
Through Shape Change

Follmer, Leithinger, Olwal, Hogge, Ishii. inFORM: Dynamic Physical Affordances and Constraints through Shape and Object Actuation. UIST '13.

Design and creation



How might we facilitate and empower this process?

Design

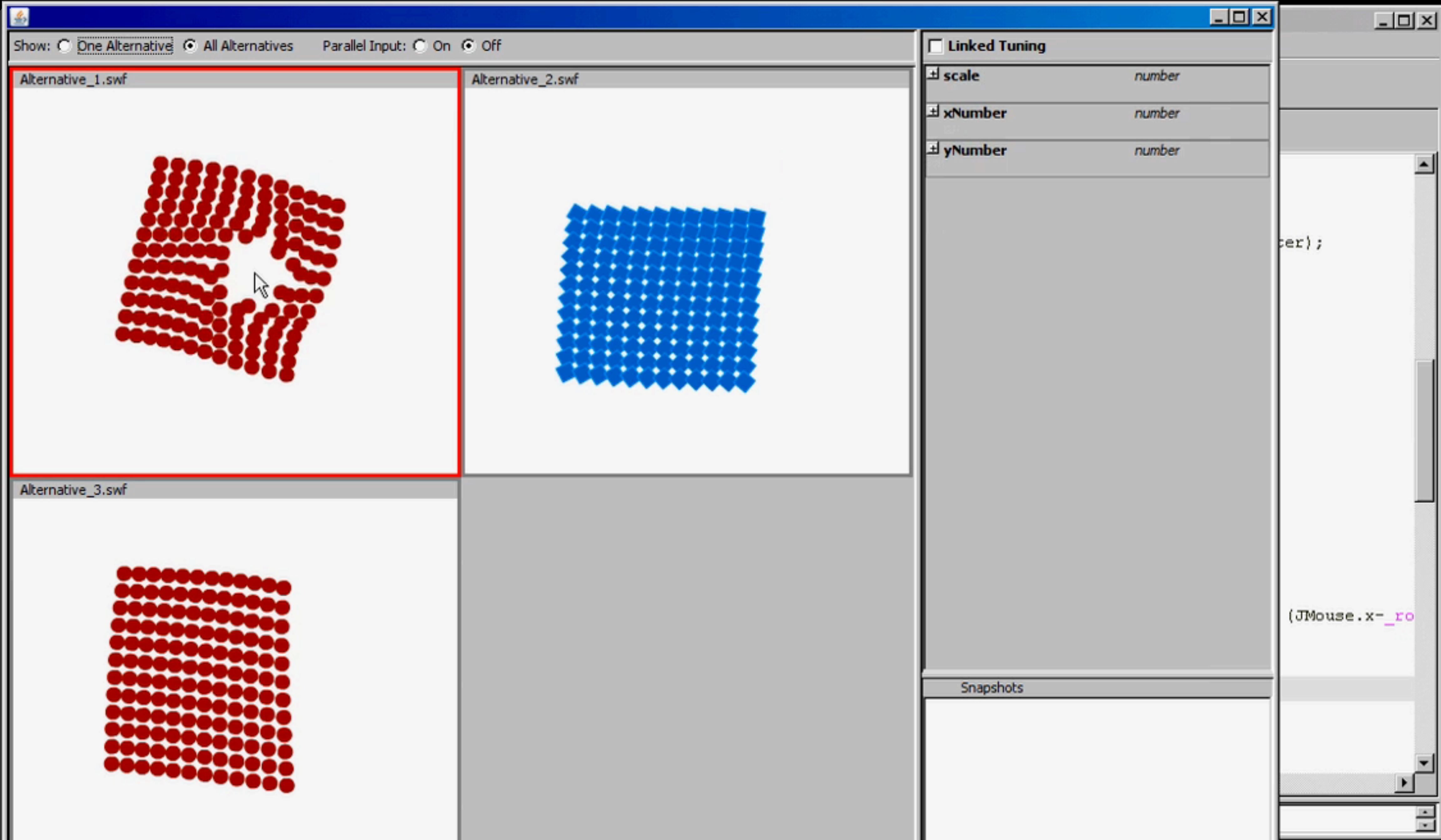
Brainstorming process
Early-stage design tools

Evaluate

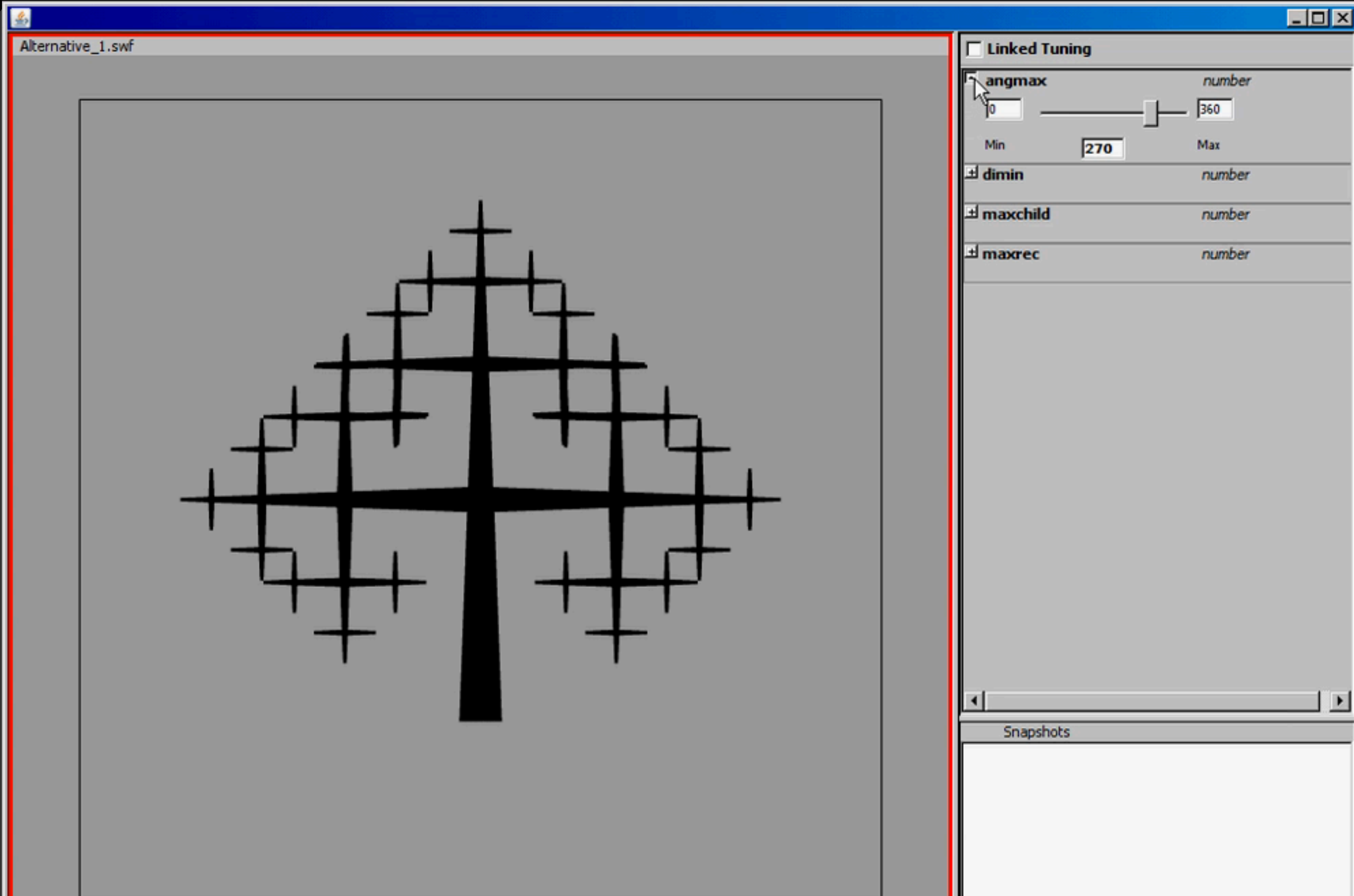
Study strategies
Cognitive modeling

Implement

Programming tools
WYSIWYG design tools
Rapid prototyping tools



Hartmann et al. Design As Exploration: Creating Interface Alternatives through Parallel Authoring and Runtime Tuning. UIST '08.



Tree matching task

Hartmann et al. Design As Exploration: Creating Interface Alternatives through Parallel Authoring and Runtime Tuning. UIST '08.



```
//-----  
//  
// scene  
//  
var ctx, canvasWidth, canvasHeight;  
  
function drawScene (canvas) {  
  ctx = canvas.getContext("2d");  
  extendCanvasContext(ctx);  
  
  canvasWidth = parseInt(canvas.getAttribute("width"));  
  canvasHeight = parseInt(canvas.getAttribute("height"));  
  
  drawSky();  
  drawMountains();  
  drawTree();  
}  
  
//-----  
//  
// sky  
//  
function drawSky () {  
  ctx.save();  
  
  var gradient = ctx.createLinearGradient(0,0,0,canvasHeight);  
  gradient.addColorStop(0, "#b4e0fe");  
  gradient.addColorStop(1, "#d3f8ff");  
  
  ctx.fillStyle = gradient;  
  ctx.fillRect(0,0,canvasWidth,canvasHeight);  
  
  ctx.restore();  
}
```

Social computing

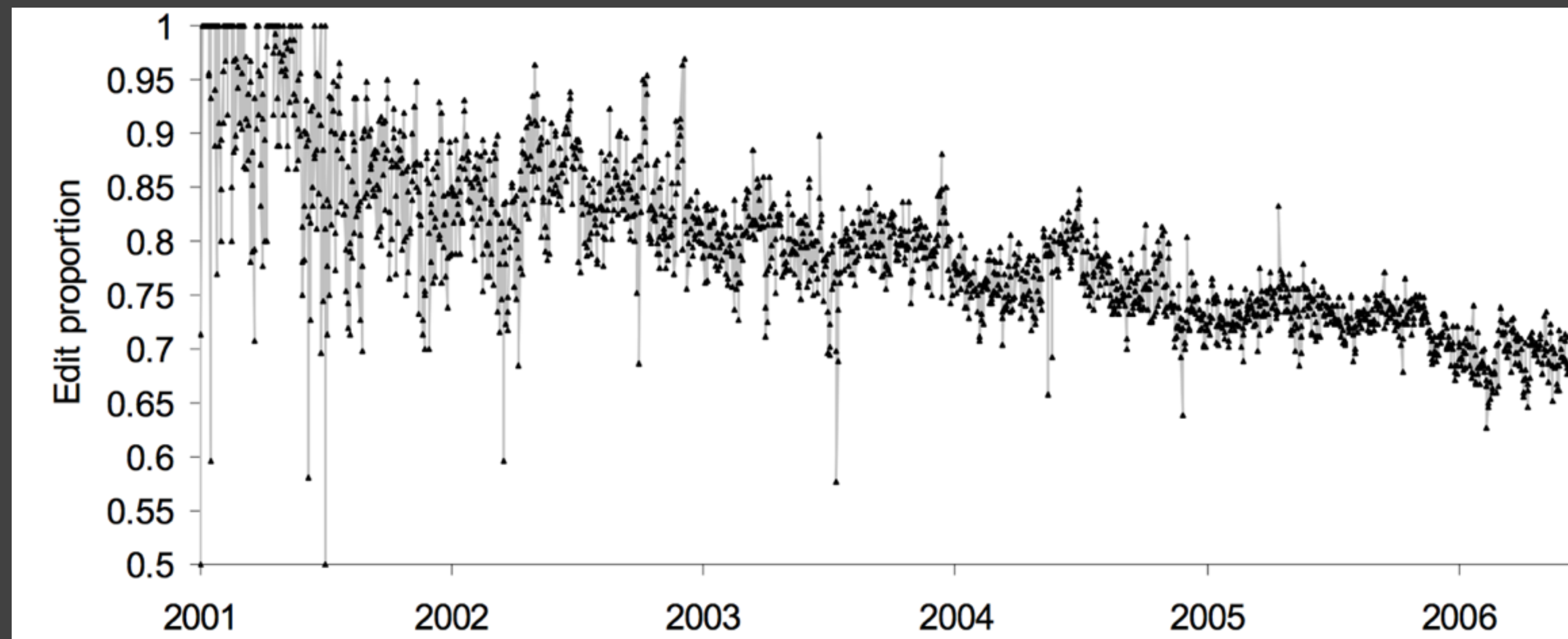
Sociotechnical system

Emergent behaviors result from interactions between social relationships and technological interventions.

Conflict and coordination

- What happens to collaboration costs as Wikipedia grows? [Kittur, Suh, Pendleton, and Chi, CHI '07]

Amount of direct work on articles goes down, and activity on coordination pages goes up



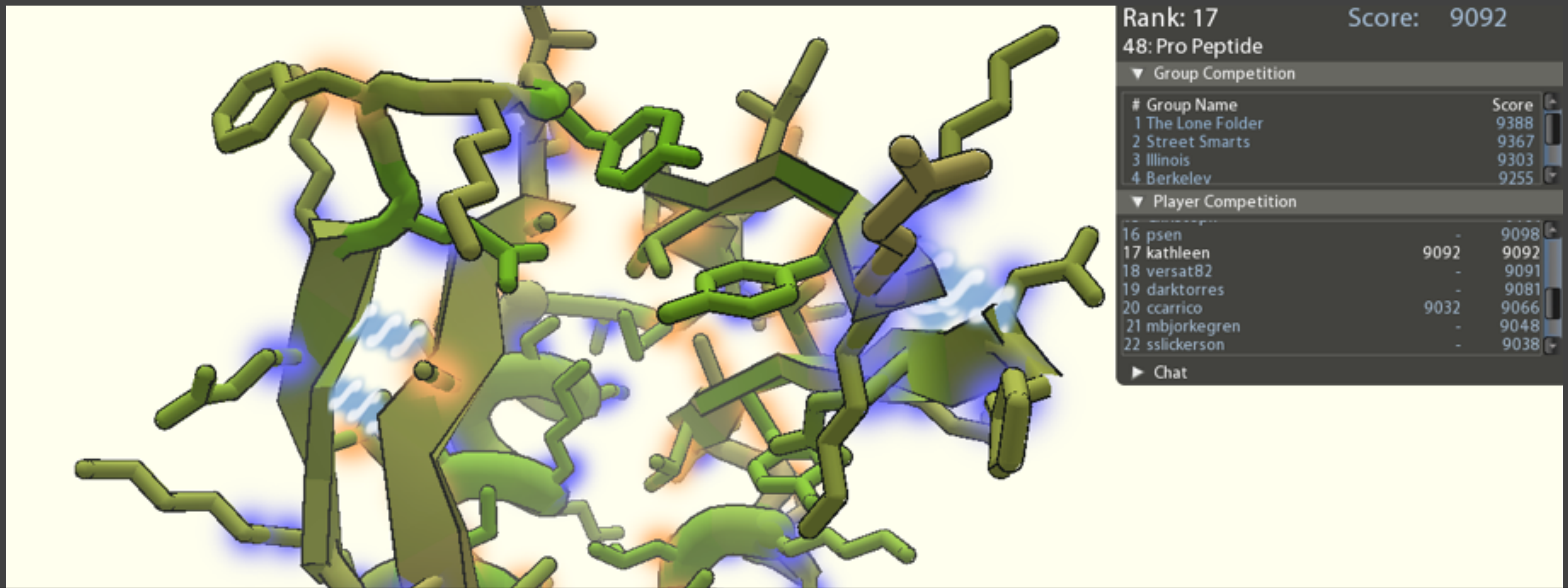
Conflict and coordination

- As more editors join, which kinds of coordination techniques succeed? [Kittur and Kraut, CSCW '08]
- Explicit: participate in talk pages
- Implicit: directly make edits

More editors only improves article quality only with implicit coordination — a few take on a disproportionate amount of work.

Scientific Collaboration

- FoldIt: protein-folding game
- Amateur scientists have found protein configurations that eluded scientists for years



The image displays a 3D model of a protein structure, rendered in green and blue, set against a white background. The structure is highly complex and folded. To the right of the protein model is a competition leaderboard interface. At the top right, it shows 'Rank: 17' and 'Score: 9092'. Below this, the text '48: Pro Peptide' is visible. The leaderboard is divided into two sections: 'Group Competition' and 'Player Competition'. The 'Group Competition' section lists four groups: '1 The Lone Folder' (9388), '2 Street Smarts' (9367), '3 Illinois' (9303), and '4 Berkelev' (9255). The 'Player Competition' section lists players: '16 psen' (9098), '17 kathleen' (9092), '18 versat82' (9091), '19 darktorres' (9081), '20 ccarrico' (9066), '21 mbjorkegren' (9048), and '22 sslickerson' (9038). A 'Chat' button is located at the bottom of the leaderboard.

Group Competition	
#	Group Name
1	The Lone Folder
2	Street Smarts
3	Illinois
4	Berkelev

Player Competition	
#	Player Name
16	psen
17	kathleen
18	versat82
19	darktorres
20	ccarrico
21	mbjorkegren
22	sslickerson

Shortn

Automatic clustering generally helps separate different kinds of records that need to be edited differently, but it isn't perfect. Sometimes it creates more clusters than needed, because the differences in structure aren't important to the user's particular editing task. For example, if the user only needs to edit near the end of each line, then differences at the start of the line are largely irrelevant, and it isn't necessary to split based on those differences. Conversely, sometimes the clustering isn't fine enough, leaving heterogeneous clusters that must be edited one line at a time. One solution to this problem would be to let the user rearrange the clustering manually, perhaps using drag-and-drop to merge and split clusters. Clustering and selection generalization would also be improved by recognizing common text structure like URLs, filenames, email addresses, dates, times, etc.



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Bernstein et al. Crowds in Two Seconds: Enabling Realtime Crowdsourcing. UIST '11.



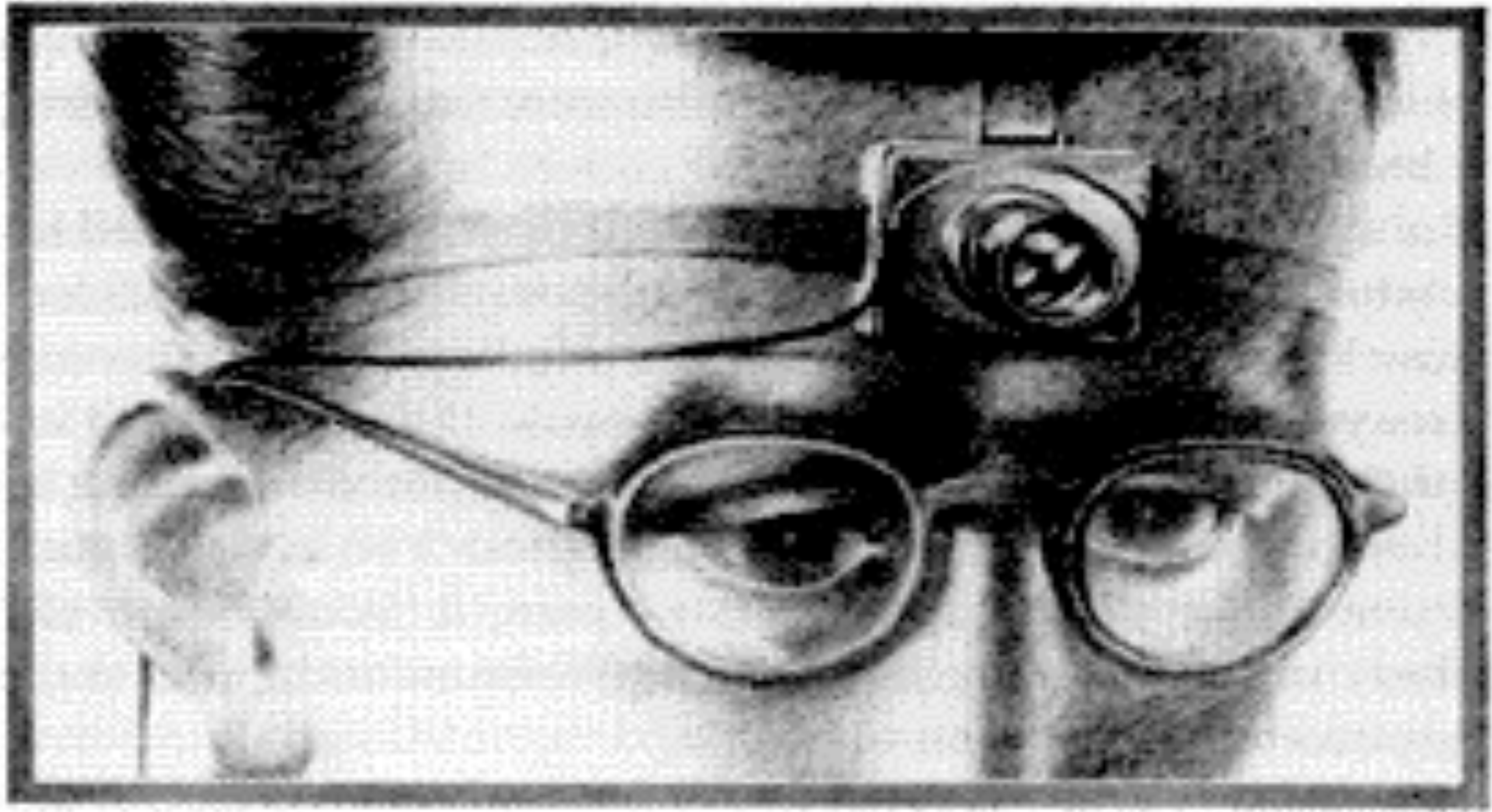
Bernstein et al. Crowds in Two Seconds: Enabling Realtime Crowdsourcing. UIST '11.

How did we get here?

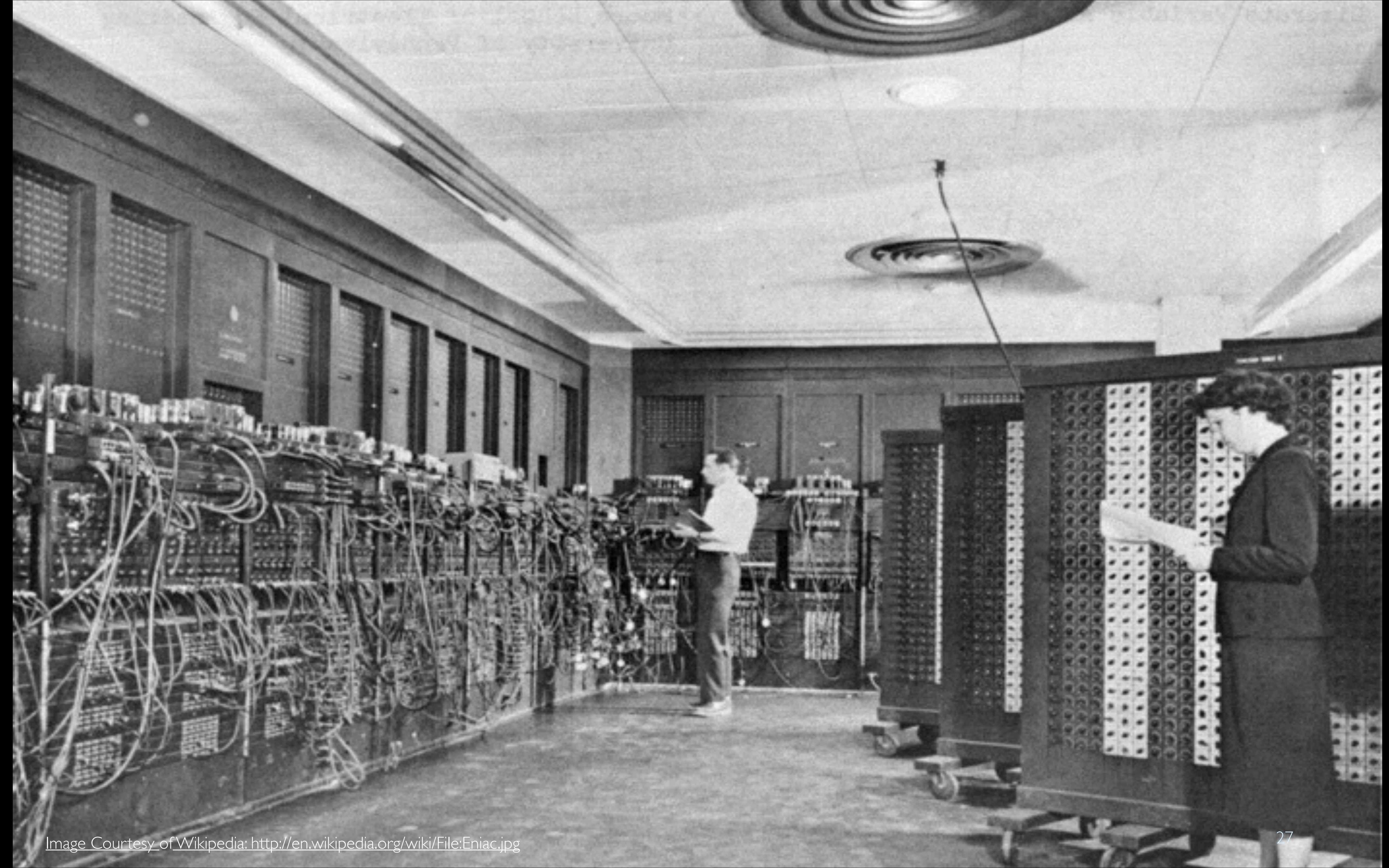


Image Courtesy of Wikipedia: http://en.wikipedia.org/wiki/File:Vannevar_Bush_portrait.jpg

Memex



A scientist of the future records experiments with a tiny camera fitted with universal-focus lens. The small square in the eyeglass at the left sights the object (*LIFE* 19(11), p. 112).





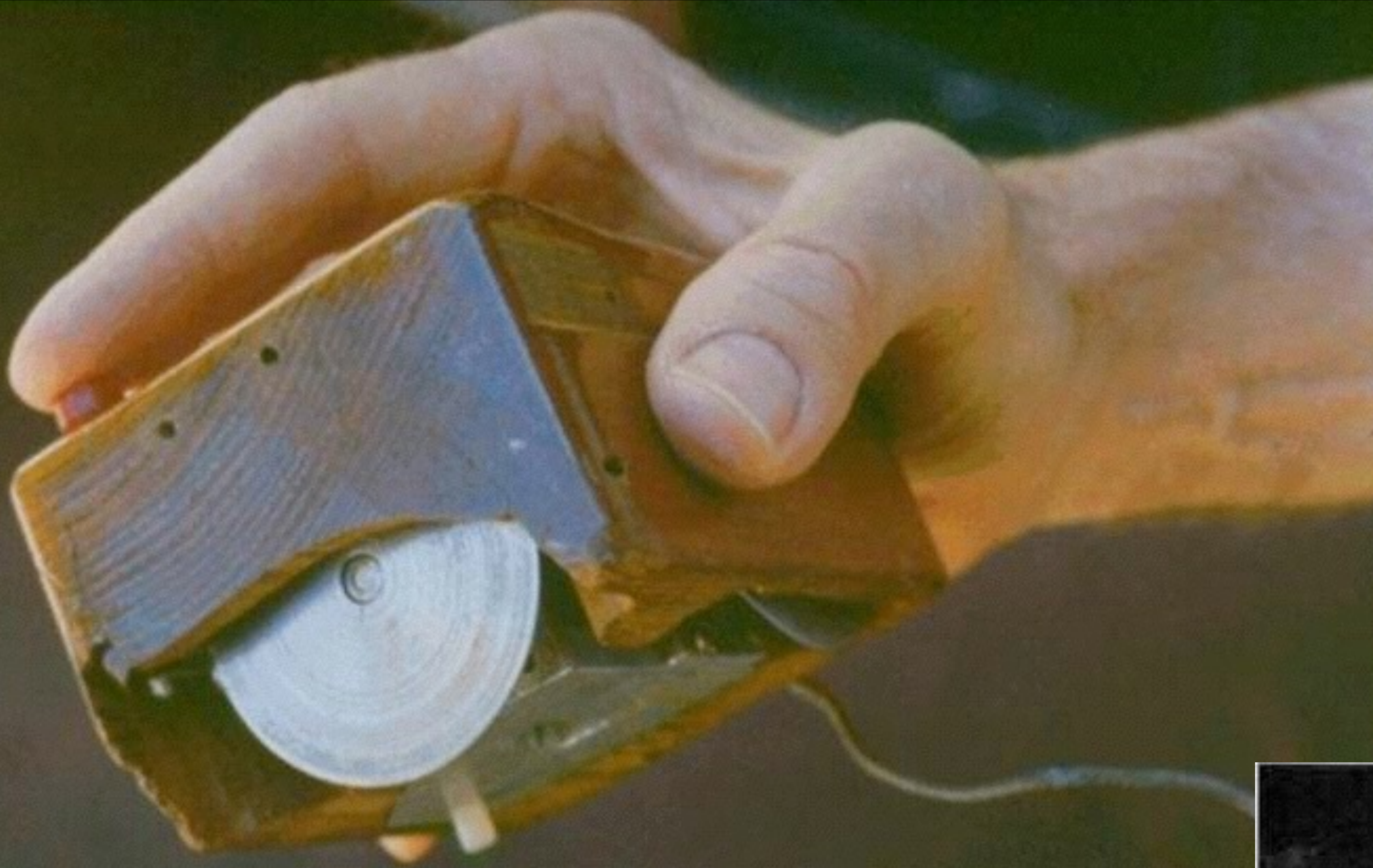
The Graphical User Interface



The Mouse and Hypertext

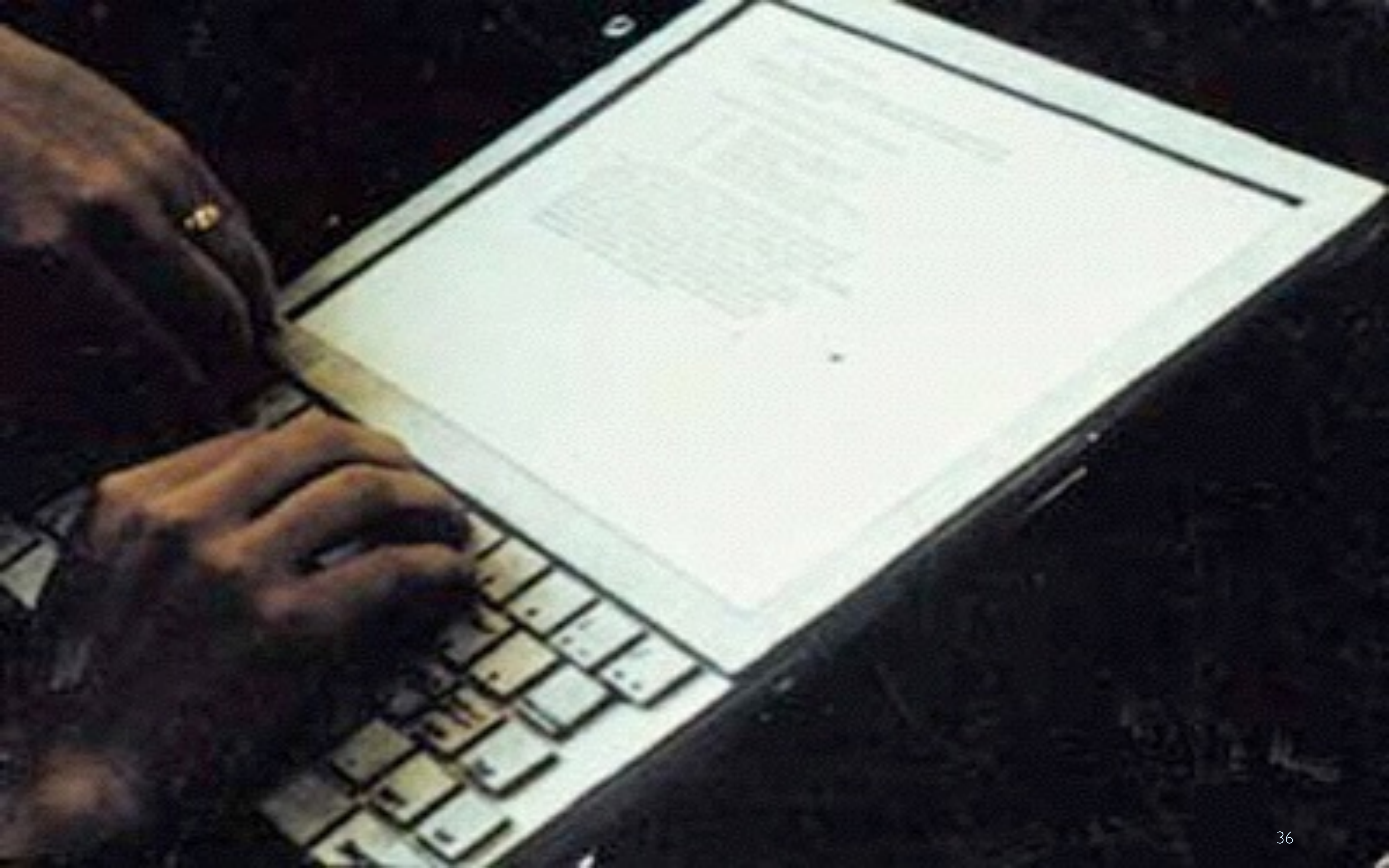


Doug Engelbart. Video Courtesy of SRI International



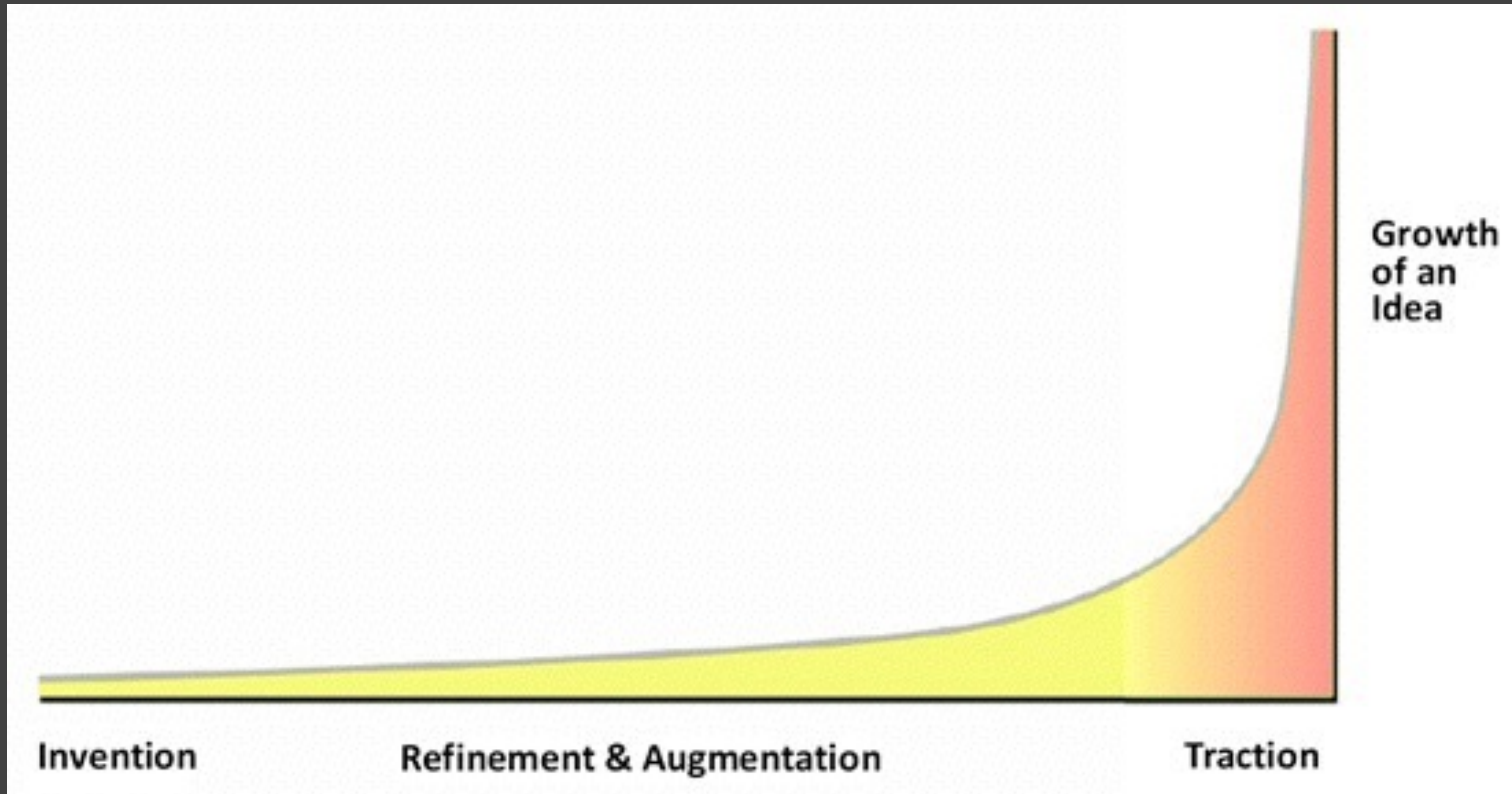
Inspires Alan Kay

“The best way to predict the future is to invent it”





The “Long Nose” of Innovation (*Buxton*)



Where do you go next?

CS147 Intro to
HCI Design

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graph LR; A[CS147 Intro to HCI Design] --> B[CS247 Interaction Design Studio]; A --> C[CS376 Research Topics in HCI];
```

CS247
Interaction
Design Studio

CS376
Research
Topics in HCI

Human

Computer

Interaction

Focus on needs.

Prototype quickly
and often.

Aid the mind and
the eye.

Know when you've
made a difference.

INTRO TO HCI DESIGN

fin.