Media and Creativity Tools

CS 347
Michael Bernstein
Create.
What are creativity tools?

Design tools were focused on creating an intervention to support a need for a specific group.

What if the goal were to create an experience, rather than to solve a problem?

Today’s tools include…

- Photoshop
- ProTools
- Max/MSP
- iMovie
- After Effects
- Final Draft (screenplays)
Today

Designing tools to support creative work

A tour through some domains…

Illustration
3D modeling
Video and Audio

Tools

Collaboration and creativity
Design principles for visual communication
Design principles

What are the rules, patterns, and processes for visual media?

The answer depends on the domain, but a similar process can be followed across domains to understand what to build.

Study expert output, Agrawala argues, not expert process, to develop principles (rules of thumb).

Test those principles against known perceptual and cognitive psychology results.

Aid or automate principles to make them accessible to non-experts.
Google Maps

Hand-drawn maps

LineDrive [Agrawala and Stolte 2001]

Step-by-step assembly [Agrawala et al. 2003]
Draco: kinetic textures

[Habib et al., CHI 2014]
Dynamic brushes

[Jacobs et al., CHI 2018]
Visual blends
[Chilton, Petridis, and Agrawala 2019]

Combinations of concepts

1. Find images & mark shapes
2. Synthesize
3. Evaluate & iterate
3D Modeling
Teddy
[Igarashi 1999]

Turn sketches into 3D shapes

Assumption: drawing plush objects. This allows the algorithm to make many inferences.
I love sketch
[Bae, Balakrishnan, and Singh, UIST 2008]

1.5x Speed
Attribit: semantic attributes

[Chaudhuri et al. 2013]
Video and Audio
Dialogue-driven editing

Automatically build sequences of frames to connect between cuts or fill time

[Berthouzoz, Li and Agrawala SIGGRAPH ’12]
Dialogue-driven editing
Automatically build sequences of frames to connect between cuts or fill time

[Berthouzoz, Li and Agrawala SIGGRAPH '12]
Musical underscoring

[Rubin et al., UIST ’12]
Tools
Gaining Tool Expertise

[Matejka et al. 2009]

Applying collaborative filtering techniques to introduce new tools in Autodesk

“Other people who used the tools that you use also use…”
COMMANDSPACE
Modeling the Relationships between Tasks, Descriptions, and Features

Eytan Adar
University of Michigan

Mira Dontcheva
Adobe Research

Gierad Laput
Carnegie Mellon University
Collaboration and creativity

Social computing + design
Scratch: kids remix and create [Resnick et al. CACM 2009]

Social: upload and remix others’ creations

All programming has been done online. This data has led to many papers on understanding notions of authorship and creative remixing.
The cost of collaboration

[Hill and Monroy-Hernández, 2013]

Test common wisdom about creative collaboration

Dependent variable: likes on the Scratch web site as a measure of quality

Common wisdom: collaborations produce better results

On Scratch: remixes of prior projects got fewer likes

Common wisdom: collaboration can improve functional items (e.g., code), not art (e.g., images, sounds)

On Scratch: remixes of code-heavy projects got more likes
Cooks or cobblers?
[Yu and Nickerson, CHI 2011]

Can crowds be creative?

1047 workers collaborated in an iterative process of design, evaluation, and combination.

Genetic algorithm asks the crowd to recombine previous ideas.
Mechanical Novel

[Kim et al., CSCW 2017]

How might we enable crowds to achieve complex work such as writing short stories?

Unlike most crowdsourcing workflows, creative work requires tight interconnections between different parts of a story, and between the high-level goal and low-level text.

Reflect
choose a high-level goal

Revise
break into tasks and edit
The Hot Air Balloon

A young boy named Malcolm finds himself alone in a runaway hot air balloon and accidentally travels to a city in the sky.

Malcolm found himself fascinated by the balloon. He imagined what it would be like to fly to some exotic location, soaring above the clouds. He closed his eyes and saw himself flying through the clouds. "Hey you!" he heard a voice shout. "What are you doing in my balloon!" The operator yelled as he dropped his snack and ran toward the balloon. Malcolm, startled by the man, stumbled. Trying not to fall he reached out and grabbed a rope hanging next to him. As he pulled it, it released the ballast and the balloon leapt into the air. Before he knew it he was rising up two feet in a moment. Horrified, he looked down.
relief as he felt the balloon descend a bit. Then suddenly a great gust of wind took the balloon and sent it higher and higher. Fell to the floor, grabbing a lever on the way down that made the balloon rise even faster.

Answer the following questions about the story:

What did you like about the story above?
I like...

What do you wish you could change about the story above?
I wish...

Is the wish you wrote above mostly about the plot, the characters, or the writing? (select one)
Choose...

In one sentence, suggest something for the next revision of the story that could change to address your comments above.
Start your sentence with the words "What if...". Try to write something specific that fits the story.
What if...
The story above! Which change should be the main change for the next revision?

<table>
<thead>
<tr>
<th>Detail and imagine throughout.</th>
<th>Think about what you wish you could change about the story. Which statement below do you agree with most?</th>
<th>Which new idea below do you think should be the main change for a revision of the story above?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I wish there would be a bit more exposition at the beginning of the story. The events all start very quickly and it's easy to not understand what's going on.</td>
<td>What if instead of beginning so abruptly, we learned a little more about Malcolm first?</td>
</tr>
<tr>
<td>Hot air balloon</td>
<td>The order of the paragraphs. It jumped all over the place.</td>
<td>What if... We wrote a new story about hot air balloons and a mistaken escape?</td>
</tr>
<tr>
<td>The previous used and it's exciting than</td>
<td>I want to see more exciting things happen to Malcom in Cloud City, and I want to know about his return to the ground.</td>
<td>What if Malcom investigates the Cloud City and then tries to get home, maybe bringing along a friend from Cloud City.</td>
</tr>
</tbody>
</table>
When he woke up, he found himself staring at a glow of big, beautiful crystal-like glass buildings, shimmering in the brilliant sunshine. One was emerald green, another ruby red, still another sparkling like diamonds, others radiating spectacular colors he had never seen. He was a little scared, to be in an unfamiliar place, but he was mostly curious. He could sense that something interesting was going on in this city, and it could be something wonderful. Maybe there were helpful people down below? Perhaps he should take a little gander and see if he can get some help with the balloon.

He suddenly found himself staring at gargantuan glass buildings, their exteriors shimmering under the sun's rays. These buildings were like no others he'd seen before - one was emerald colored, another ruby red, and a third sparkling like a multifaceted diamond. This scenery was frightening, yet, he was curious. Something was going on in this city, and it could be something wonderful. Maybe there were helpful people down below? Perhaps he should take a little gander and see if he can get some help with the balloon.
Discussion

Find today’s discussion room at http://hci.st/room