What Is (And Isn’t) HCI Research?
Announcements

Readings: the magic of Stanford’s library proxy
https://library.stanford.edu/using/connecting-e-resources/connect-campus-faq

Assignment: Articulating HCI Contributions due next Friday 9am
Research vs. practice

Research introduces a **new idea** into the world of human-computer interaction

This new idea is called a **contribution**. Research contributions follow a formula:

**Setup**: Other researchers (and industry) all thought one way about a problem

**Punchline**: “No, let’s do it this way instead.” The researcher offered a new perspective that nobody had ever considered or made feasible before. They proved out their idea as the better approach.
Research vs. practice

Research contributions in HCI articulate a high-level approach to design, or a social scientific insight. While they are situated in a particular context, ideas are **generalizable** and can be applied to new situations.

**Examples from last class**: audio sensing interfaces for wearables, projecting interfaces onto body surfaces, using a sensor embedded in electrical wires in wall to detect interaction in a room.
How do I know?

For design and engineering ideas

**Ask yourself:** is it possible to solve this problem using a technique that is already known?

  - If so, it is not research (but combinations of known techniques might be).
  - If not, it is more likely to be research.

**Ask yourself:** has this technique been introduced in other HCI contexts?

  - If so, it is not research.
  - If not, it is more likely to be research.
How do I know?

For design and engineering ideas

Ask yourself: is the problem one that is known to the HCI community?

If so, it is not research.

If not, it is more likely to be research.

A good idea may be old news! (Ex: Apple Watch)
How do I know?

For *social science* ideas

**Ask yourself**: is this phenomenon describable or is this question answerable using our existing social scientific knowledge?

If so, it is not research.

If not, it is more likely to be research.
Address a new problem with an old solution

Score a podcast with music (new) using music and speech analysis methods (old)

State of the literature

Animate sketches (old) using kinetic textures (new)

Address an old problem with a new solution

Address a new problem with a new solution
How do people reason about invisible algorithms in news feeds?

State of the literature

Answer a new question with an old method

Quantify tie strength by analyzing Facebook use

Answer an old question with a new method
Examples
“Location sensing to autoshare shopping habits.”

Could be research if:

Nobody has ever proposed sharing shopping habits and understanding how sharing affects shopping practices

Your solution generalizes to other problems

e.g., sensing location based on smell

e.g., public shaming to change behavior

Probably not research if:

You are applying a solution that we know about already to a problem that we know about already
“A mirror to show me how I’d look if I lost weight”

Could be research if:

- Nobody has ever studied how people use technology to directly visualize health outcomes
- Your solution generalizes to other problems and has never been demonstrated before (e.g., a model that generates realistic weight loss alterations)

Probably not research if:

- You are applying a solution that we know about already to a problem that we know about already
  - e.g., this is a focused user-centered design project
- e.g., you are not contributing a new technique or domain
“Researching the new hot app TikTak.”

Could be research if:

- TikTak exemplifies an interesting point in the design space, and we use it to understand that design space.
- Theories suggest that TikTak should work one way or should not succeed, but it’s the opposite.

Probably not research if:

- You have trouble articulating what broader design choice TikTak is an example of.
- We have studied applications like TikTak in the past, and TikTak works the same way.
- You have to put the word “researching” in the title.
Motivation for Novelty

A novel problem or technique isn’t quite enough. The novelty should be well motivated:

**New problem:** why is it important to solve it?

**New technique(s):** How is it better than the previous technique(s)?

**Underscore:**
Score a podcast with music (new) using music and speech analysis methods (old)

**Draco:**
Animate sketches (old) using kinetic textures (new)
Introduction to Content Creation
Content
# What are content creation tools?

Tools designed to facilitate the creation of media content.

Today's tools include...

<table>
<thead>
<tr>
<th>Photoshop</th>
<th>iMovie</th>
<th>Illustrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProTools</td>
<td>After Effects</td>
<td>Blender</td>
</tr>
<tr>
<td>Max/MSP</td>
<td>Premiere</td>
<td>Unreal</td>
</tr>
<tr>
<td>Unity</td>
<td>Final Draft (screenplays)</td>
<td>GPT3 ???</td>
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</tbody>
</table>
Today

A tour through media content creation tools in a few domains …

Audio and Video
Sketching
3D Modeling
Animation
Audio and Video
[Abel and Glass 1999]
Example musical underlay
from This American Life #441: "When Patents Attack!"

Underscore
[Rubin et al., CHI 2014]
"Great Expectations"
Charles Dickens

Underscore
[Rubin et al., CHI 2014]
Underscore

[Rubin et al., CHI 2014]
Underscore
[Rubin et al., CHI 2014]
**Story:** Charles Dickens – “Great Expectations”  
Read by Mark F. Smith [librivox.org]  
**Music:** Damiak – “Tenuous Gears”

**Underscore**  
[Rubin et al., CHI 2014]
**Story:** David Sedaris – “Go Carolina”  
Read by David Sedaris [Hachette Audio, 2001]

**Music:** El Chicano – “Viva Tirado Pt. 1”

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**Underscore**  
[Rubin et al., CHI 2014]
**Story:** David Sedaris – “Go Carolina”  
Read by David Sedaris [Hachette Audio, 2001]  
**Music:** Clint Mansell – “Sacrifice”  

**Underscore**  
[Rubin et al., CHI 2014]
Text-driven editing
[Berthouzoz et al. 2021]

Time-aligned transcripts to specify edit - much easier than scrubbing a timeline!

Automatically generate seamless transitions
CROSSCAST
Adding Visuals to Audio Travel Podcasts

Haijun Xia, Jennifer Jacobs, Maneesh Agrawala
University of California, San Diego
University of California, Santa Barbara
Stanford University
Sketching
Sketchpad
[Sutherland 1962]

First use of light pen
First use of GUI windows

Rubberband lines
Constraint-based drawing
Obj. oriented master/insts
Sketchpad
[Sutherland 1962]
First use of light pen
First use of GUI windows
Rubberband lines
Constraint-based drawing
Obj. oriented master/insts
Draco: kinetic textures

[Habib et al., CHI 2014]
Wow! @autodesk Sketchbook Motion (AKA @rubaiat et al, Draco, CHI 2014), was chosen by Apple as iPad App of the Year. sketchbook.com/motion
Sketch-n-sketch

[Hempel et al., UIST 2016]
3D Modeling
Teddy
[Igarashi 1999]

2D Sketches into 3D shapes

**Assumption:** drawing inflatable objects

Allows algorithm to make many inferences
I love sketch

[Bae, Balakrishnan, and Singh, UIST 2008]
Animation
Video Puppetry
[Barnes et al. 2008]

New technique performance with physical props to make animation.
Video Puppetry
[Barnes et al. 2008]

New technique
performance with physical
props to make animation.
3D Puppetry
[Held et al. 2012]
Extend idea to 3D
3D Puppetry
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