05: Primer on HCI (part 1)

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Administrative Notes

- Assignment #1 is announced.
  - “Detecting & Mitigating a bias in abusive language detection”
  - You’ll:
    - explore the given datasets.
    - write code for detecting & mitigating bias.
    - discuss implications for human-AI interaction.
  - Detailed description in video.
  - Important: VPN and change the password
  - There will be office hours.
  - Due: 11:59pm Mar 30 (Tue)

Previously on CS492E...

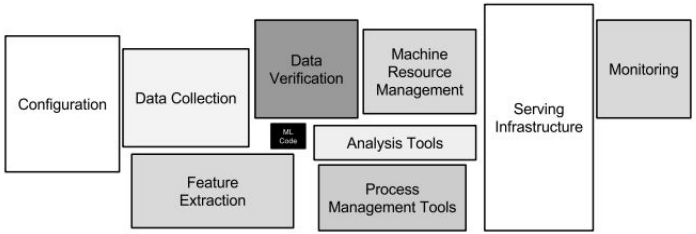


Figure 1: Only a small fraction of real-world ML systems is composed of the ML code, as shown by the small black box in the middle. The required surrounding infrastructure is vast and complex.

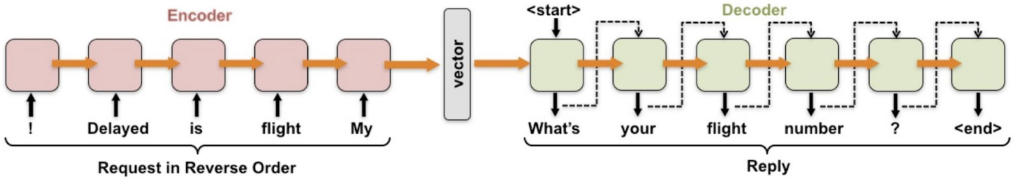
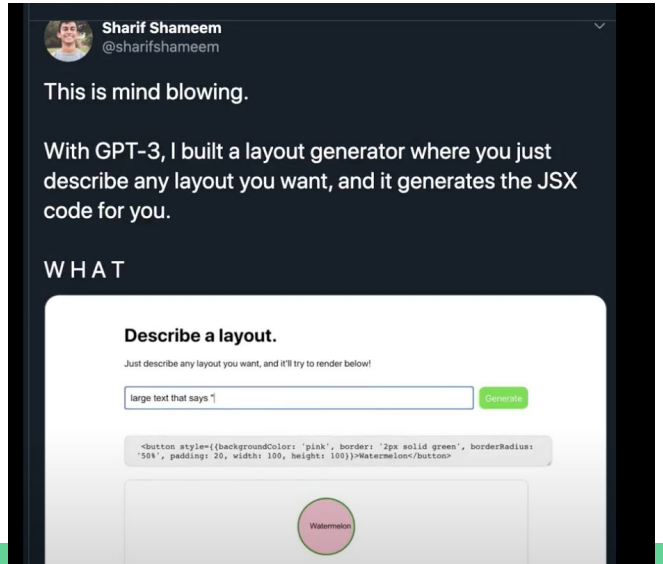


Figure 1. Sequence-to-sequence learning with LSTM neural networks.



Designing your own sentiment analysis tool

While there are a lot of tools that will automatically give us a sentiment of a piece of text, we learned that they don't always agree! Let's design our own to see both how these tools work internally, along with how we can test them to see how well they might perform.

I've cleaned the dataset up a bit.

Today's Learning Objectives

After today's class, you should be able to...

- Understand the basics of HCI concepts and heuristic evaluation.
- Apply HAI guidelines to a real-life example.
- Understand the basics of web programming for frontend implementation.

HCI 101 in 10 mins

Human-Computer Interaction is about making computers that are...

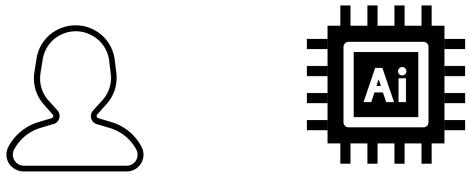
useful
usable

HCI accomplishes the goal by designing and building better...

interaction

What happens when the computer is AI? What's different about it?

interaction



probabilistic & statistical
hard to predict
autonomous
adaptable

accurate, cheap, efficient
objective & biased

human-like
doesn't involve humans
replaces or scares humans
...

User experience **models**

Implementation model

Conceptual model

Worse ← → Better

Mental model

Example from https://medium.com/@vinoth3.141/mental-model-ux-64e7a9d2a03f

https://www.youtube.com/watch?v=rxdyp_dyYZU

Whose fault is it?

“Stupid users keep making mistakes
when using this simple feature.”

“I built this really cool thing.
How come nobody uses it?”

Human Error?

No, it’s BAD DESIGN.

You’re not the user.

UI is about communicating with users.

Users are NOT LIKE YOU.

The user is ALWAYS RIGHT.

Usability problems are the designer’s fault.

Usability

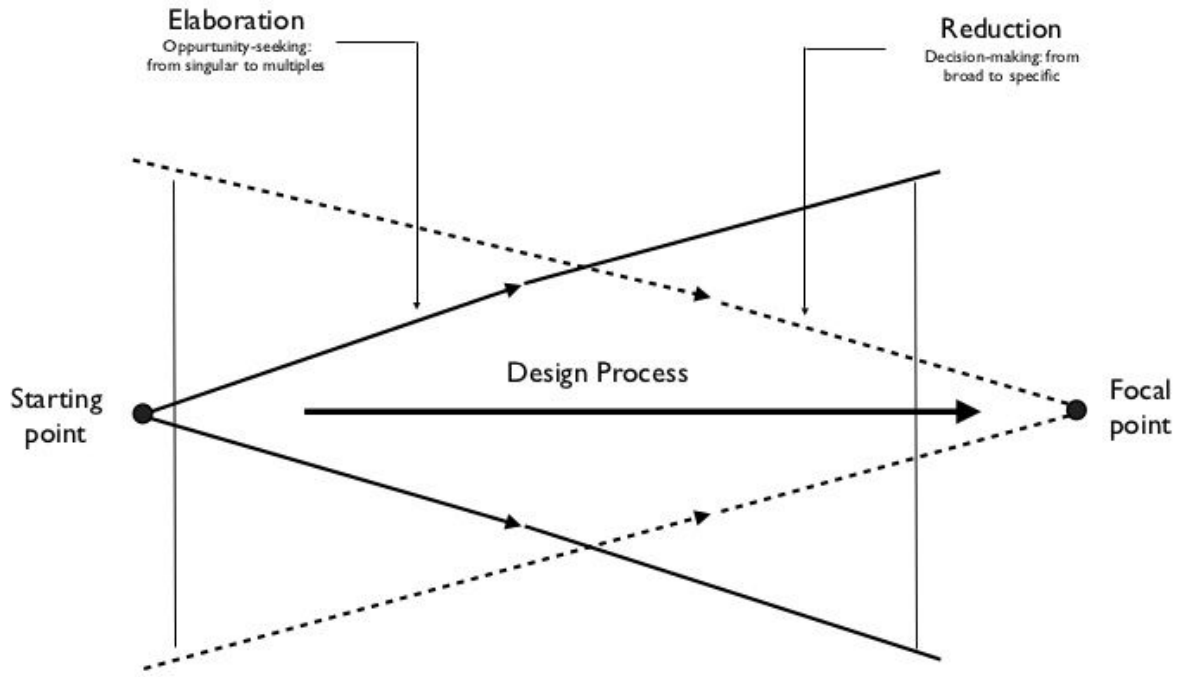
how well users can
use the system's functionality

Learnability: is it easy to learn

Efficiency: once learned, is it fast to use?

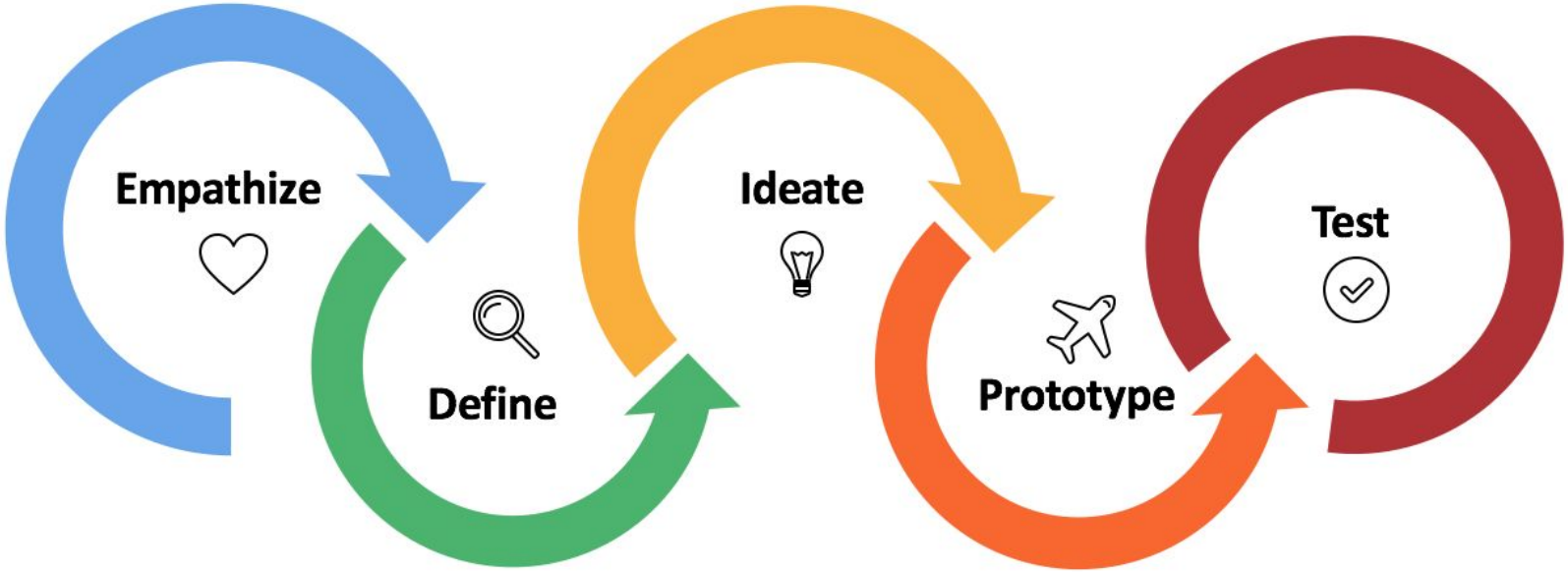
Safety: are errors few and recoverable?

L.Galli The Design Funnel



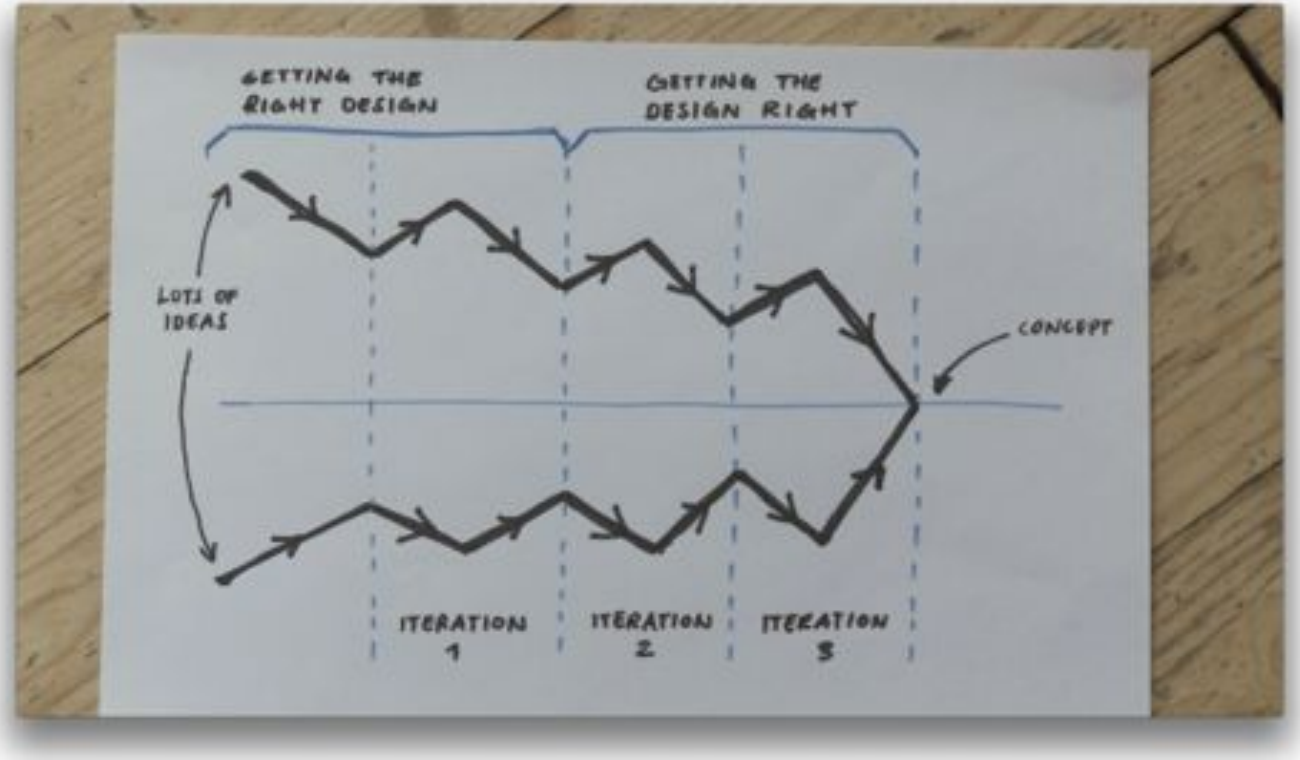
Bill Buxton 2007, Sketching User Experiences; Paul Laseau 1980, Graphic Thinking for Architects and Designers

User-Centered Design Process



http://www.spring2innovation.com/2019/04/design-thinking-vs-user-centred-design/

Low ⇒ High Fidelity Prototyping



Usability Testing Methods in HCI

- Formative Evaluation
- Field Study
- Controlled Experiment

Testing with users

- Heuristic Evaluation

Testing with experts

Heuristic Evaluation

- small (3-5) group of UI evaluators (normally experts)
- apply usability principles
  (heuristics that best capture context)
- identify usability issues w/ ref to heuristics

Nielsen’s Heuristics

- Match the real world
- Consistency & standards
- Help & documentation
- User control & freedom
- Visibility of system status
- Flexibility & efficiency
- Error prevention
- Recognition, not recall
- Error reporting, diagnosis, and recovery
- Aesthetic & minimalist design

How to do Heuristic Evaluation

- Justify every problem with a heuristic.
  - Avoid emotional reactions: “I don’t like it.”
- List every problem.
- Go through the interface at least twice.
  - Once to get the feel of the system
  - Again to focus on particular interface elements
- Don’t have to limit to the 10 Nielsen heuristics.

Heuristic Evaluation vs Usability Testing

- Evaluator is not the user either
  - Maybe closer to being a typical user than you are, though
- Analogy: code inspection vs. testing
- HE finds problems that UT often misses
- But UT is the gold standard for usability.

“Guidelines for Human-AI Interaction”

Main Strengths from RR

- Practical for both designers and developers
- Comprehensive
- Concrete examples
- Thorough methodology to design the guidelines

Main Criticisms from RR

- Weak ethics considerations ⇒ **Upcoming classes**
- Limited implications for the end-to-end design/development cycle ⇒ **Upcoming classes**
- Centered around GUIs ⇒ **Today's activity**
- Some abstract guidelines esp. around social

G5	**Match relevant social norms.** Ensure the experience is delivered in a way that users would expect, given their social and cultural context.
G6	**Mitigate social biases.** Ensure the AI system's language and behaviors do not reinforce undesirable and unfair stereotypes and biases.

ACTIVITY: Heuristic Evaluation

- Now that you're a Human-AI Interaction expert, let's class-source heuristic evaluation of an AI-infused product: **voice-based conversational assistant (e.g., Siri, Alexa, Google Assistant)**
- Use the 18 guidelines from the paper to perform heuristic evaluation.
- Submit **at least three usability issues** using the form below. (Just reopen the link each time to add a new issue.) [**5 mins**]

yellkey.com/occur

HTML/CSS/JavaScript Tutorial

https://docs.google.com/presentation/d/1hgw48JD0OOEXNqx0nYbvs9XqYM4qyP9ZJCSSAN7EFQs/edit