

Lecture 2: Research Lifecycle & Contribution

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Topics

- Project topic
- Research lifecycle
- Research contribution type
- In-class exercise

Project Topic

When AI meets HCI

Course Evaluation

In-class Discussion: Lead discussion	10%
Participation	15%
Assignment: Literature Review	20%

Subtotal: 45%

Final Project	55%
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Total: 100%

Research Lifecycle

- Identify your topic/interest
- Literature review
- Brainstorming
- Iterative convergence
- Prototyping
- User study
- Video/finalize
- Advertisement
- Follow-up

Find a topic/interest

- Ideal approach
 - An emergent important topic (a new field) which you have skills and background to excel
- Typical approach
 - Find a topic of your interest
 - From your hobby
 - From your own problems
- Shortcut
 - Ask experts

Literature Review

- Topic overview
 - Book
 - Survey paper
 - Literature review from seminal papers
- Question/problem driven
 - Write down the question
 - Only look for papers that's directly related to your question
 - don't be distracted with interesting, but not so relevant papers
 - Use "good" papers as anchor points for tree-based search
 - These "good" papers are the keys to your problem

Brainstorming

- A well-prepared presentation followed by guided discussion
 - Literature review to introduce the topic
 - A taxonomy of what has been done
 - Identified gaps
 - Discussion
 - Any missing references?
 - Which gap is more promising?
 - What usage scenarios/problems are interesting?
 - Any suggestions for alternative solutions?

Iterative Convergence

- Identify possible solutions
- Literature review again to ensure it hasn't been done before
 - If has been done, quickly adjust direction/solution
 - If has not, move to the next step
- For each solution, identify "goals"
- For each goal, define "measurement of success"
- Come up with cheap and dirty ways to get a sense of whether or not your solution can beat the state of the art
 - If promising, move to prototyping stage
 - If not, go to alternative solutions
 - If all alternative solutions have been tried, go back to literature review/brainstorming stage

Note: Brainstorming can happen multiple times @ different abstraction level

Iterative Brainstorming

Example

- **Topic:** voice-based word processing
 - Brainstorming 1 -> How to perform eyes-free word processing?
 - Idea: use prosody as an additional information channel for word processing
 - Brainstorming 2 -> How to use prosody for word processing?
 - Idea: Use emphasize to help formatting the text, etc.
 - Brainstorming 3 -> How to balance prosody and commands for error correction?
 - Idea: blah, blah

Iterative Topic Convergence

Example

- **Topic:** a taxonomy for finger gestures
 - Literature review -> has been done
- **Alternative topic:** a taxonomy for finger gestures while holding an object

Important: You only
proceed to prototyping if
you already know you are
either the first or the best!

Prototyping

User Studies

Video/Paper

Are you done?

NO!

Advertising!!!

Follow-up!!!

Research Contribution Workshop

In-class Exercise

End