Finding Research Topics

Research Methodology in Computer Science
CSCI 514

Research is a Craft!

- Research is carefully planned
  - May not know precisely what one is looking for but know in general the kinds of materials needed.
  - How to find them
  - How to use them

Finding Topics

- Goal: To ask a question whose answer solves a problem that you can convince readers to care about

- From an interest to a topic
  - List interests
  - Google scholar
  - Skim subheadings in a general bibliography

- From a broad topic to a focused one
  - Add words such as "conflict", "contributing", and "developing" to the topic

Formulate Questions

- Asking the right questions is key to successful research
- Start with 'who, what, where, when' (facts), but move on to 'how' and 'why' (analysis)
- Question your topic from as many angles as you can think of – questions give your research purpose and direction
- Listening to other people's questions might help you formulate your own
- There are some questions that have no answers

From a Focused Topic to Questions

- Inventory of Questions to Direct your Research
    - Explore the history of your topic
        - Fit it into a larger developmental context
    - Structure and composition
        - How does your topic fit into the context of a larger structure or function as part of a larger system?
    - How is your topic categorized?
    - Turn positive questions into negative ones
    - "What if" speculations
    - Build on agreement
- Evaluate Questions
    - Find the ones that make you think about your topic in a new way
    - Avoid "settled fact" questions

Is the problem actually significant?

- Research should discover, show, explain, and convince

- Turning practical problems into research problems

- Three Useful Steps
  - *Name your topic*: I am working on/studying …
  - *Suggest a question*: I am working on/studying … because I want to find out how/why …
  - *Motivate the question/find a rationale*: I am working on/studying … because I want to find out how/why … in order to understand how/why …

Thinking in Print

- Write to remember
- Write to understand
- Write to gain perspective

Assignment

- Write down a list of three research topics that interest you. For each topic, write 1-2 paragraphs describing what the open issues are that warrant research. Cite your resources. List CS professors who may agree to to be your advisor for the topic.