

(June 2005)

How to find a Research Topic

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Outline

- What is research?
- Research questions
- Awareness
- Tips for choosing a research topic
- Literature survey
- Some tips from my experiences

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What is research?



- Research = วิจัย = เฝิน = ค้นคว้า สืบค้น ตรวจสอบ และ พิสูจน์
- วิจัย = ปัญญา (ท่านเจ้าคุณพระธรรมปิฎก)
- ระดับการวิจัย
 - ค้นหาความจริง
 - ค้นหาสิ่งที่ดี สิ่งที่เป็นประโยชน์
 - ค้นหาทางที่จะทำให่ดี
 - ค้นหาทางที่จะทำให่สำเร็จ

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What is research?



- Problem = ปัญหา = สิ่งบีบคั้น ดัดขัด กับข้อง
- Research Question

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Finding a research topic



- What claims will the thesis make?
- Why should anyone care?

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Advantages of research question?



- Use a question as a guideline
- Starting place for all researches
- Question calls for **Answer**
 - Describe different opinions
- A Question leads to other Questions
- Open Question calls for real research and thinking
- A Question is conversational

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What makes a good research question?



- Interests you!
- Is it significant?
- Is it neither too specific nor too general?

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Awareness



- Interesting to you
- Interesting to your advisor
- Interesting to research community

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How do I choose a topic?

(Ohio U)



- Choose a topic which interests you personally!
- Pick a topic no one else is likely to be working on.
- Select a topic with a moderate amount of published information.
- Scan current magazines and scholarly journals for topic ideas.
- Be flexible! (a shift of focus)
- Talk with your advisor!

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How to choose a research topic

(UC, Santa Cruz)



- Select a topic that interests you
- Read through background info.
- Start making a list of key words
- Write out your topic as a statement and select main concepts
- Start making a list of words to describe your topic

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How to pick a worthy topic in 10 sec?



- By Prof. Comer
- Purdue University

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Topic Generator



Column 1	Column 2	Column 3
integrated	mobile	network
parallel	functional	preprocessor
virtual	programmable	compiler
interactive	distributed	system
responsive	logical	interface
synchronized	digital	protocol
balanced	concurrent	architecture
virtual	knowledge-based	database
meta-level	multimedia	algorithm
optimized	binary	toolkit
active	object-oriented	display
parameterized	secure	technology
conceptual	high-speed	solution
scalable	real-time	language
dynamic	functional	agent
high-level	parallelizing	theorem prover
collaborative	watermarking	work cluster
type-safe	proxy	cache

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Topic Generator Example



A synchronized secure protocol

for
related to
derived from
applied to
embedded in

A synchronized secure protocol for an
interactive knowledge-based system

An interactive mobile database derived from
a dynamic logical toolkit

A balanced functional protocol for an optimized
object-oriented agent

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Conducting a Literature Review



- Find out what is already be done
 - Methodology
 - Design
 - Source of data
 - measurement tools
- Increase your confidence in your topic
- Comparing research on the topic
- New ideas and approaches
- Explanation and interpretation
- Other researchers contact

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Write up one page summary for each paper



■ Aim:

- What is the main purpose of this paper?
- What's the problem(s) the author(s) attempt to attack?
- What is the ultimate goal for this research?

■ Contributions:

- What is the contribution of this paper to this field?
- How does this paper distinguish itself from others?

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Write up one page summary for each paper



■ Limitations:

- What are the limitations of the proposed approach in this paper?
- Does the proposed scheme limit to certain conditions?

■ Comparison:

- Is there any similar research papers available?
- If so, what is the difference among them?

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Write up one page summary for each paper



Observation:

- What is my personal observation/opinions of this paper?
- Is there any alternative solution (or better solution) than the proposed scheme?

Questions:

- Do not expect to fully understand all of the content in this paper! Highlight the sections that you don't understand.


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In summary, you should find out ...



- What was the research topic
- How did they study it
- What did they find
- Ideas the authors suggest for further research
- What was striking about the article
- Your own ideas


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Some tips from my experiences

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5 key points



- Problem statement
- Survey
- Propose Method
- Evaluation Process (Metrics)
- Contribution

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(Your Own) Research Journal



■ What is in there?

- Interesting questions
- Problems
- Possible solutions
- References to read
- Notes on articles and papers you've read

■ “Don't plan to share your journal with anyone -- **write freely**”

by <http://gradschool.about.com/cs/thesiswriting/a/rchjournal.htm>

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(Your Own) Research Journal My experience



- Collection of all (my) ideas
- Remind me for some interesting notes, examples, mistakes, or pitfalls
- My research timeline
- A good source for writing a paper or thesis

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My advise about “Advisor”



- Sources of information
- Sources of research topics
- **“Be prepared !”** to meet advisor
 - Not go with empty hands (mind)
 - Summarize what you have
- Regularly meet him/her
 - Advisor (sometimes) does not bite
- **Do** what he/she want first and argue later !
- He/She is **“The One”**

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References



- U of Nebraska
<http://www.unl.edu/mcnair/Handouts/FindingResearchTopic.htm>
- http://vulcan.ee.iastate.edu/~morris/paper_survey.html
- CS Topic Generator, Purdue U
- How do I choose a topic? Ohio U
- How to choose a research topic?, UC, Santa Cruz
- <http://gradschool.about.com/cs/thesiswriting/a/rcjournal.htm>

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