Mansoura University
Faculty of Computers and Information
Department of Information Technology

Research Methodology

Dr. Fatmaelzahraa Ahmed AbdelGhani

Chapter 2

How to Select Research Topics

OUTLINE

- Preamble

- Identify an Area of Interest

- Browse the Literature

- Pick a Topic and Dive

- Identify a Research Question

- Artificial Intelligence a Trending Topic in Computer Science and Technology

OUTLINE

- **Preamble**
- **Identify an Area of Interest**
- **Browse the Literature**
- Pick a Topic and Dive
- Identify a Research Question
- Artificial Intelligence a Trending Topic in Computer Science and Technology

PREAMBLE

- **Choosing study directions and subjects for scientific and engineering research** is influenced not only by personal interests, but also by the authors' previous knowledge and current research trends.

- *Note:* Following the key research trends will be highly essential in many science and engineering disciplines because research trends change very fast.

- A huge question that should be answered when deciding to gain experience by being involved in research is:

What will I study?

If you have decided to join a research lab or jump on board with research that a particular professor is conducting, this question will be answered for you.

However, if you will conduct research through an independent study of your own under the advisement of a faculty member, or if you have joined a lab designed to facilitate students' independent research endeavors, this question will probably consume much of your time.

IDENTIFY AN AREA OF INTEREST

- The most challenging part when working in the research is to select the topic.

  At that point, you are asking if the topic that you picked is big, too narrow etc.

- You can start by selecting a point that attracts you or that you are curious about because:

  - You will work on it for a while.

  - This will help accelerating your progress.

  - This will help you learning something valuable during your research process.

IDENTIFY AN AREA OF INTEREST (CONT.)

- Therefore, there are some assisting tips to choose the first research topic:

  1. Select a topic that you care about/interested in (as mentioned above).

  2. Narrow the chosen topic to a manageable one.

     Because it will be too difficult to focus with a broad one due to the too information available.

     Reading the background can help in limiting the scope of the selected topic.

  3. If there are guidelines for topic selection, review it in order to select one of the allowed topics.

IDENTIFY AN AREA OF INTEREST (CONT.)

- Therefore, there are some assisting tips to choose the first research topic:

  4. Refresh your knowledge through referring to the related texts and lecture notes that are related to the topic.

  5. Discuss different research ideas with a friend since this can help arising issues that wasn't appear before.

  6. Ask yourself the following questions:

     o **Why** did you choose the topic? (why it interests you? Do you have an opinion about the issues involved?)

     o **Who** will be affected by the chosen topic? (who will provide you with the needed information? Who may publish the obtained information?)

     o **What** are the major questions that arises in this topic? (What are the issues and different viewpoints to be considered? Is there a debate about it?)

     o **Where** will your topic be important? (Is it locally, nationally or internationally).

     o **When** the topic will be important? (Is it currently important or it is historically matter?).

BROWSE THE LITERATURE

- Another source that can spark a flame to select your research idea can be through reviewing the literature.

- Throughout this process, you can browse the **abstracts** of different articles that are already available in the field that you are interested in.

- This approach can help in:

  o What has been studied.

  o What hasn't been studied yet.

  o What hasn't been studied a lot.

  o What has been ignored.

- Therefore, reading the abstract will give you an overview about the topic of interest, and among the abstracts and when you become attracted to a certain work, you will jump automatically to the body of the work and read it deeply.

BROWSE THE LITERATURE (CONT.)

- Also, you can read a general encyclopedia article (more general articles) because this can help in:

  o Getting an overview about the topic.

  o Knowing the relation between your chosen idea and the related issues in the targeted research area.

  o Finding commonly used words in describing the targeted topic.

BROWSE THE LITERATURE (CONT.)

- In case of not finding articles that are related to the targeted topic:

  o Use can use broader terms.

  o Ask for help, for example from the librarian.

BROWSE THE LITERATURE (CONT.)

- Finding the required literature in the targeted topic can be through:

  o Use the article database that most famous in your domain.

  e.g., google scholar and arXiv are good tools in general while in computer science field, IEEE explore is a powerful tool to find related articles.

  o Use Web search engines to find suitable web sites for the targeted topic.

  o Scan through the industrial needs by exploring articles and news from the internet.

REFERENCES

- Meikang Qiu, Han Qiu, Yi Zeng. Research and Technical Writing for Science and Engineering. CRC Press, 2022.

Thank you ☺