

# Literature Review

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# Outline

- ◉ Literature review functions
- ◉ Literature review advantages
- ◉ Literature review characteristics
- ◉ When to start reviewing process?
- ◉ What to look for?
- ◉ Where to look?
- ◉ How to read?
- ◉ How to record?
- ◉ How to write?
- ◉ Pitfalls
- ◉ How to improve?

# Literature review functions

- To justify
  - research question
  - theoretical or conceptual framework
  - method
- To develop and refine your research idea
- To establish the importance of the topic
- To provide background information
- To demonstrate your understanding
  - To show familiarity with significant and/or up-to-date research relevant to the topic

# Literature review functions

- ⦿ “Not a shopping list” of everything that exists
- ⦿ To combine both summary and synthesis
  - **Summary**
    - ⦿ Recap of the important information of the source
    - ⦿ Analyze critically a segment of a published body
  - **Synthesis**
    - ⦿ Re-organization
    - ⦿ Reshuffling information
    - ⦿ Critical combination of previous research
- ⦿ Provide new interpretation of old material or combine new with old interpretations

# Literature review Advantages

- Make sure that you are not working on solved or saturated problem
  - Prevent duplication of effort
- Help you correctly identify the problem
- Lead you to the field
  - Speak and understand the same language (such as concept, abbreviation, notation) as other researchers
- Let you learn from other experiences
- Educate you about research restrictions and awareness
- Show you related research pools of knowledge
- Show you how to compare your work
  - Tools, data test set, benchmark
- Help you map out a clear research relationship

# Literature review Advantages

- To establish your study as one link in a chain of research that is developing knowledge in your field
- Not plagiarize
  - Give credit: cite other research work properly
- Reader can trace back for more specific information as required
- Standard references and citation, for other researchers, reduce searching time

# Literature review characteristics

- ◉ Broad (General) review
- ◉ Related field review
- ◉ Related specific topic review

# When to start reviewing process?

- After roughly select the interesting topic
  - Before starting other research activities
  - Before identify the clear research problem
  - Broad review
- During working on your research
  - Continuously review currently / new-coming research
  - Keep up to date information about related work
  - Related field review / Related specific topic review
    - To find a particular technique or method
    - Very targeted search
  - Refine your scope



# What to look for?

- Identify keywords
  - Start searching based on keywords
- Where do keywords firstly come from?
  - Broad review
  - Content of background section (not the literature review section)
- How to screen search results
  - May get lots by the keyword
    - Check relevancy
      - Read the abstract and summary
    - Check date
      - Obsolete in old articles
    - Check authority
      - Article source
      - Author credibility
      - Impact of the article

# Where to look ?

## ○ Real users

- Discuss / Interview

## ○ Academic database

- <http://ieeexplore.ieee.org>
- <http://portal.acm.org>
- <http://www.sciencedirect.com>
- <http://isiknowledge.com>
- <http://www.scopus.com>
- <http://search.ebscohost.com>
- <http://www.scirus.com>
- <http://www.springerlink.com>
- <http://scholar.google.com>

# How to read?

## Speed reading: Skim

### ◉ Meaning

- To get only the **general information**
- To grab the main idea of the paper
- Not read every word
- However, still roughly understand

### ◉ Skimming steps

- Read the title
- Read the authors' name
- Look at the references
- Carefully read the **first paragraph (Abstract)**
- Read the sub-topic and the first sentence of each paragraph
- Read through with fast speed and look for
  - Main idea, Clue words
- Carefully read the **conclusion**

### ◉ Practice skimming by

- Read newspaper and magazine
- Select a book in a library before check it out

# How to read?

## Speed reading: Scan

### ○ Meaning

- To get only **specific information**
  - Such as name, date, word
  - Example: looking for a person in the phonebook

### ○ Scanning steps

- Make up your mind about **what are you looking for (Keyword)**
- Let your eyes move slightly fast line-by-line
- Read 2-3 sentences at a time
- **Look only** for your **keyword**
- If keyword is found, read the particular sentence
- Mark the sentence

### ○ Practice scanning by

- Find a keyword in an introduction section

# How to record?

- Manage what you have read
  - Bibliographic details: Title, year, authors, publication source
  - Supplementary information: For Internet article, time it is retrieved
  - Using reference management tools such as **Endnote**
- Archive the paper
  - Keep (pdf) files handy for retrieval
- Note what you found
  - Brief Summary of content
    - Key words, evaluative comments
  - Write down interesting points
    - Concept, problems, awareness
  - Your Engineering Journal
    - Help you writing a paper or thesis

# Before writing

- Clarify
  - Clear objective
  - What types of sources (books, journal articles, websites)?
  - Should you summarize, synthesize, or critique your sources
  - Should you evaluate your sources?
  - Should you provide subheadings and other background information, such as definitions and/or a history?
- Look for other literature reviews in your area of interest
- Narrow the topic
  - Thousands of articles and books on most areas of study
  - Roughly pick a number of sources to be included
- Consider whether your sources are current
  - > 3-5 years old, Information could be obsolete

# Literature Review Development

- Similar to primary research
- Requires four stages:
  - Problem formulation
    - Identify topic or issues
  - Literature search
    - Find relevant materials
  - Data evaluation
    - Determine which literature makes a significant contribution to the understanding of the topic
  - Analysis and interpretation
    - Discuss and conclude of pertinent literature

# Structure of the literature review

- Break down literature review into **two parts**
- Preliminaries
  - Give a description of main techniques, algorithms or methodologies
  - Very common in development project
- Related works
  - Identify the similarity done by researchers
    - Describe them one by one with brief summary of your own
    - Group similar works together and compare and contrast them
  - Point out what makes your project different from others
  - Important part of research project
- Can have both or either of them



# Another structure

- Break down literature review into **three parts**
- Introduction
  - Provide reader with scale and structure of your review
  - Serves as a kind of map
- Body of the review
  - Should be evaluative and not merely descriptive
    - For example, possible reasons for similarities or differences between studies are considered rather than a mere identification of them
- Conclusion
  - Sum up main findings of your research
  - Aims of the study you are proposing to do
  - Provide reader with a coherent background

# Typical ways of organizing review

- ◉ Chronological
- ◉ By publication
- ◉ By trend
- ◉ Thematic (Theme)
- ◉ Methodological
- ◉ Questions for Further Research

# Plan your Review

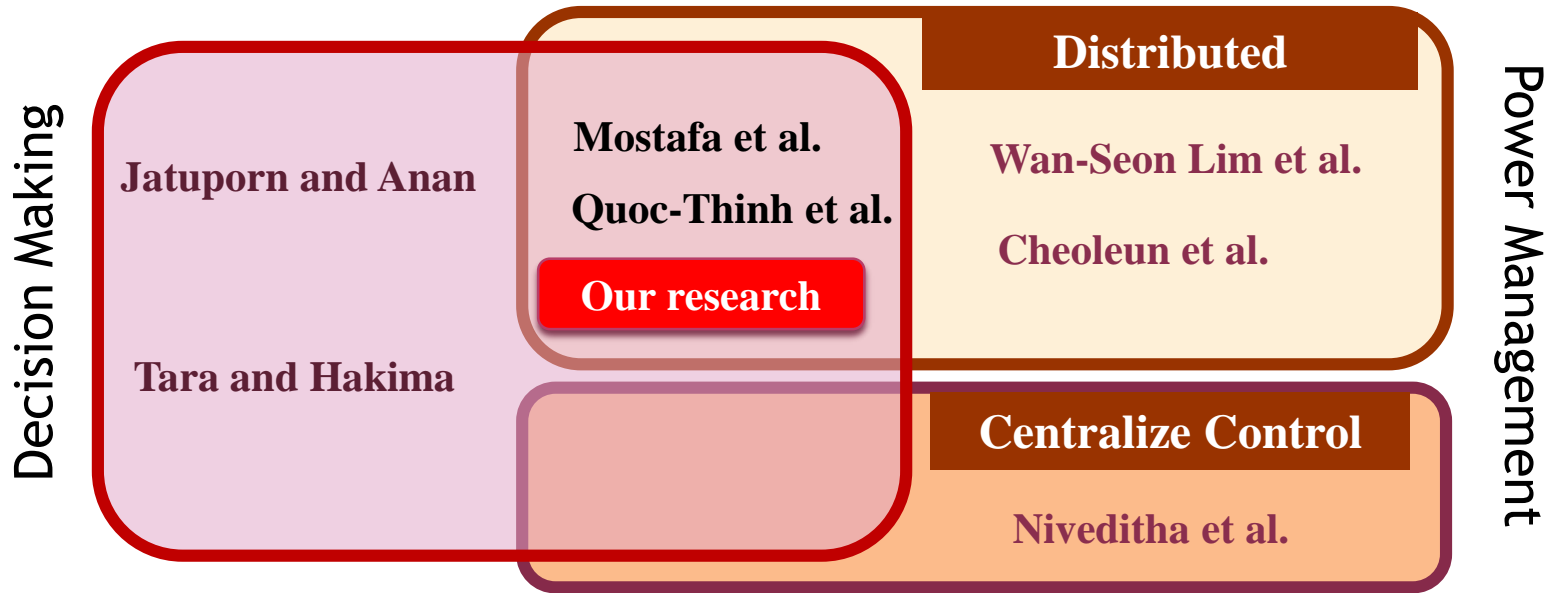
## ◉ Map / Tree

- Use tools such as MindMap
- Draw pictures
- Link between concepts and processes
- Show relationship between ideas and practice
- Show how topic branches out into subthemes

## ◉ Table

- Classify your thought in tabular form

# Related work in Diagram (Method used)



# Comparison Table

| Related Work             | Characteristics     |                      |                       |             |               |                 | Evaluation Matrix  |            |                          |           |
|--------------------------|---------------------|----------------------|-----------------------|-------------|---------------|-----------------|--------------------|------------|--------------------------|-----------|
|                          | Always Best Connect | Static Scanning Time | Dynamic Scanning Time | Centralized | Decentralized | Decision making | Power Supply Level | Motivation | Location Detection (GPS) | Idle Mode |
| Quoc-Think et al. (2008) | √                   | √                    |                       |             | √             | √               | √                  | √          | √                        | √         |
| Cheoleun et al. (2007)   | √                   |                      | √                     |             | √             |                 |                    | √          | √                        |           |
| Wan-Seon et al. (2008)   |                     |                      | √                     |             | √             |                 |                    |            | √                        |           |
| Mostafa et al. (2009)    | √                   | √                    |                       |             | √             | √               | √                  |            |                          |           |
| Niveditha et al. (2008)  |                     |                      |                       | √           |               |                 |                    |            |                          |           |
| Jatuporn and Anan (2007) | √                   | √                    |                       |             |               | √               |                    |            |                          |           |
| GU Chen et al. (2008)    | √                   | √                    |                       |             |               | √               |                    |            |                          |           |
| Tara and Hakima, (2009)  | √                   |                      | √                     |             | √             | √               | √                  | √          |                          | √         |
| <b>Proposed Work</b>     | √                   | √                    |                       |             | √             | √               | √                  | √          | √                        | √         |

# How to write?

- ◉ **Not** summarized by authors or years
  - Literature review is **not just a simply list** your sources and go into detail about each one of them, one at a time
- ◉ Create your own categories
  - Summarize from your understanding
  - Classified by method/algorithm usage, layering, solving approach
- ◉ Pin point for
  - Main concept
  - Important of unsolved problem
  - Agreement
  - Argument: supported with valid evidence
  - Method usage
- ◉ Distinguish clearly between fact and opinion
- ◉ What are you going to do
  - Problem statement
  - Your method with reason

# Note on writing review

- ◉ By Dr.Sutreera (Prince of Songkla University)
- ◉ One place (a particular topic) in the review must be supported by more than one paper
- ◉ One paper maybe appeared in more than one place

# Bad Example

Until recently many researchers have shown interest in the field of coastal erosion and the resulting beach profiles. They have carried out numerous laboratory experiments and field observations to illuminate the darkness of this field. Their findings and suggestions are reviewed here.

JACHOWSKI (1964) developed a model investigation conducted on the interlocking precast concrete block seawall. After a result of a survey of damages caused by the severe storm at the coast of USA, a new and especially shaped concrete block was developed for use in shore protection. This block was designed to be used in a revetment type seawall that would be both durable and economical as well as reduce wave run-up and overtopping, and scour at its base or toe. It was proved that effective shore protection could be designed utilizing these units.

HOM-MA and HORIKAWA (1964) studied waves forces acting on the seawall which was located inside the surf zone. On the basis of the experimental results conducted to measure waves forces against a vertical wall, the authors proposed an empirical formula of wave pressure distribution on a seawall. The computed results obtained by using the above formula were compared well with the field data of wave pressure on a vertical wall.

SELEZOV and ZHELEZNYAK (1965) conducted experiments on scour of sea bottom in front of harbor seawalls, basing on the theoretical investigation of solitary wave interaction with a vertical wall using Boussinesque type equation. It showed that the numerical results were in reasonable agreement with laboratory experimental data.



# Good Example

## A cross-layer adaptive algorithm for multimedia QoS fairness in WLAN environments using neural networks

Wang, C.; Lin, T.; Chen, J.-L.;

Communications, IET

Volume: 1 , Issue: 5

Digital Object Identifier: [10.1049/iet-com:20060264](https://doi.org/10.1049/iet-com:20060264)

Publication Year: 2007 , Page(s): 858 - 865

IET JOURNALS

## 1 Introduction

With the popularity of IEEE 802.11 based wireless local area networks (WLAN) capable of providing high data rates ranging from 1 Mbps up to 54 Mbps, the demands of multimedia services for mobile users are growing. Various kinds of multimedia applications such as streaming video, Internet phone and net meeting, require differentiated quality-of-service (QoS) guarantees because of their differentiated traffic types. Thus, the provision of QoS in 802.11 medium access control (MAC) becomes increasingly important. Most of current 802.11 MAC employ distributed co-ordination function (DCF) [1], a random access protocol based on a carrier sense multiple access with collision avoidance (CSMA/CA), on account of its distributed nature for the simplicity of implementation [2]. To provide multimedia services in such contention-based networks, fairness is of particular concern because the QoS performed essentially depends on the sharing of transmission mediums among users.

The fairness of IEEE 802.11 DCF has been largely investigated in previous works [2–14]. The study reported by Koksai *et al.* [3] shows that 802.11 DCF presents short-term unfairness of channel sharing due to the backoff protocol in CSMA/CA, which can therefore make a significant impact on delay-sensitive applications like real-time audio and streaming video [3]. However, Berger-Sabbatel *et al.* [4]

provided a contrary perception that DCF indeed presents pretty fine fairness. They argued that the confusion of fairness problems in the previous work [3] is as a result of analysing the behaviour of CSMA/CA protocol specific to Wavelan system [15] instead of that characterised in 802.11 standards. Actually, the two access methods present a significant difference between them: the Wavelan CSMA/CA protocol executes exponential backoff when the channel is sensed busy, whereas 802.11 protocol does that only when a collision is experienced. Although the analysis of Berger-Sabbatel *et al.* [4] is rather consistent with the behaviour of present 802.11 protocol; however, the conclusion is valid only under the assumption of homogeneous link qualities among hosts, which may be impractical. In fact, hosts in WLANs commonly experience different signal qualities, especially in an indoor environment, that hosts close to the access point (AP) have a line-of-sight signal whereas those obstructed by physical objects experience much degraded signal quality. To cope with dynamic channel conditions to provide a good transmission quality, for example an acceptable level of bit error rate (BER), 802.11 standards on physical layer (PHY) [1] support a link adaptation mechanism, which dynamically selects one modulation and coding scheme (MCS) such that BER of the selected MCS with the highest data rate is within the prescribed performance bound. If all hosts have the same BERs, their throughputs will be equal regardless of their transmission rates [6]. This phenomenon is so called ‘performance anomaly’ [5]. However, even with a link adaptation mechanism, the link qualities among hosts will not likely be the same at most of the time since the MCS available are limited, which may therefore cause the unfairness of throughput sharing among hosts.

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doi:10.1049/iet-com:20060264

Paper first received 28th April 2006 and in revised form 28th January 2007

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# Good-Bad Literature Review

| Good                              | Bad                             |
|-----------------------------------|---------------------------------|
| a synthesis of available research | an annotated bibliography       |
| critical evaluation               | confined to description         |
| appropriate breadth and depth     | narrow and shallow              |
| clarity and conciseness           | confusing and longwinded        |
| rigorous and consistent methods   | constructed in an arbitrary way |

# Tips on writing (Language Focus)

## ○ Sentence

- Express one idea in a sentence

## ○ Paragraph

- Group sentences that express and develop one aspect of your topic
- Use a new paragraph for another aspect or another topic

## ○ Consistent Grammar

- Appropriate use of commas, colons and semi-colons
- Incorrect use of punctuation can affect the meaning.

## ○ Transition Words

- Use link words to show contrast of your argument
- e.g. 'hence', 'therefore', 'but', 'thus', 'as a result', 'in contrast'

# Tips on writing (Language Focus)

- Create a balance between direct quotation (citation) and paraphrasing
- Avoid too much direct quoting
- When you are citing a specific author's findings
  - Use past tense (e.g. found, demonstrated)
- When you are writing about an accepted fact
  - Use present tense (e.g. demonstrates, finds)
- When you are citing several authors or making a general statement
  - Use present perfect tense (e.g. have shown, have found, little research has been done)

# Pitfalls

## ○ Vagueness

- Include too much information
- Include **too obvious** or **have no interest** to the audience in the literature review
- Include **not very relevant (important)** literature -- consider the reader

## ○ Limited range

## ○ Insufficient information

## ○ Omission of

- Contrasting view
- Recent work

# How to Improve ?

- ◉ Regularly attending conferences
- ◉ Join research discussion group (e.g. in your lab)

# References

- ◉ Writing literature reviews  
<http://www.monash.edu.au/lls/llonline/writing/general/lit-reviews/index.xml>
- ◉ Skim and Scan  
[http://cc.domaindx.com/chantana/pre\\_read.htm](http://cc.domaindx.com/chantana/pre_read.htm)
- ◉ สุธีระ ประเสริฐสรรพ. สนุกกับงานวิจัย. สำนักงานกองทุนสนับสนุนการวิจัย , 2544
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