How to write a scientific paper?

NHUNGVT-2021

Project topics

1. Image spam filter
   + Setup a Mail server t
   +Integrate a filter that can scan spam contents in images
1. Statistical Spam filter
   + Setup an Email server
   + Configure Bayes statistical algorithm to filter textual spams

What is a scientific paper?

❑A research paper is a piece of **academic writing** based on its author's original research on a particular topic and analysis together with **interpretation of research findings**.

❑Researchers should ask questions before writing:

❑Does your paper propose something new?

❑Does your paper produce a better solution compared to current solutions?

❑Does your paper provide valuable information?

➔ If your paper can not meet these requirements, it is not high-quality paper.

Scientific Format

Title

Authors

Introduction

Materials and Methods

Results (with Tables and Figures)

Discussion

Acknowledgments

Literature Cited

Tittle

Make your title specific enough to describe the contents of the paper, but not so technical that only specialists will understand.
- Short, Brief but Enough Information, but not So Technical that only specialists will understand

The title should be appropriate for the intended audience.

The title usually describes the subject matter of the article
- Effect of Smoking on Academic Performance

Sometimes a title that summarizes the results is more effective:
- Students Who Smoke Get Lower Grades

Types of title that can be used for scientific papers

Indicative titles indicate the subject matter of a paper but give no indication of any results obtained or conclusions drawn e.g. *The effectiveness of bed nets in controlling mosquitoes at different seasons of the year.*

Informative titles give an indication of results achieved and conclusions drawn as well as the subject matter of the paper e.g. *Bed nets control mosquitoes most effectively when used in the rainy season.*

Question-type titles

This type of title obviously asks a question. e.g. *When are bed nets most effective when used to control mosquitoes?*

Activity 1: Thinking of Topics

❑Writing a title for a given abstract

Abstract 1

An authentication service is one of the the most fundamental building blocks for providing communication security. In this paper, we present the MOCA (MObile Certificate Authority) key management framework designed to provide authentication service for ad hoc wireless networks. MOCA is a distributed certificate authority (CA) based on threshold cryptography. We present a set of guidelines for a secure configuration of threshold cryptography to maintain strong security. MOCA utilizes a carefully selected set of mobile nodes to function as a collective certificate authority while the MOCA nodes are kept anonymous. Equipped with a novel routing protocol designed to support the unique communication pattern for certification traffic, MOCA achieves high availability without sacrificing security. Both the security of the framework and the operational performance is evaluated with rigorous analysis and extensive simulation study.

Abstract 2

A mobile communications device having a digital certificate authenticating the device itself is proposed. A server for authenticating the device and a method of authenticating the device are also disclosed. The device comprises a transmitter, a processor, a memory and a computer readable medium. The memory includes a certificate certifying the authenticity of the mobile communications device, the certificate comprising device-specific data and a digital signature signed by an authority having control of the authenticity of the mobile communications device. The computer readable medium has computer readable instructions stored thereon that when executed configure the processor to instruct the transmitter to transmit a copy of the certificate to a service provider in response to a request to authenticate the mobile communications device with the service provider.

Literature Review

A literature review is a description of the literature relevant to a particular field or topic.

It gives an overview of:

| What has been said | Key writers | Prevailing theories and hypotheses | Questions being asked | Appropriate and useful methods and methodologies |

Literature Review (cont.)

It may take two forms

- Purely descriptive – as in an annotated bibliography. A descriptive review should not just list and paraphrase, but should add comment and bring out themes and trends.

- A critical assessment of the literature in a particular field, stating where the weaknesses and gaps are, contrasting the views of particular authors, or raising questions. It will evaluate and show relationships, so that key themes emerge.

It can be

- A whole paper, which annotates and/or critiques the literature in a particular subject area.
- Part of a thesis or dissertation, forming an early context-setting chapter.
- a useful background outlining a piece of research, or putting forward a hypothesis.

DO

Look at the relationships between the views and draw out themes

DON'T

Just write a list or quote authors without citing them

Good resources for a scientific paper

- Books

- Journal article

- Conference proceeding

- Statistical sites

- Trusted academic sources: scholar.google.com, ACM, Google books, IEEE, researchgate,Pearson, Springer,...

Journal Impact Factor

- What is it?

- How does it matter when writing a scientific paper?

- How to assess the impact factor?

- Where can you find the impact factor?

The impact factor (IF) or journal impact factor (JIF) of an academic journal is a scientometric factor based on the yearly average number of citations on articles published by a particular journal in the last two years.

In other words, the impact factor of 2020 is the average of the number of cited publications divided by the citable publications of a journal.

A journal impact factor is frequently used as a proxy for the relative importance of a journal within its field.

Normally, journals with higher impact factors are often deemed to have more influence than those with lower ones. However, the science community has also noted that review articles typically are more citable than research articles.

1. " Advances in Computers (Impact Factor: 55)"
2. " IEEE Transactions on Pattern Analysis and Machine Intelligence (Impact Factor: 19.417)"
3. " Information Fusion (Impact Factor: 13.201)"
4. " IEEE Communications Magazine (Impact Factor: 12.727)"
5. " IEEE Wireless Communications (Impact Factor: 12.588)"
6. " IEEE Transactions on Neural Networks and Learning Systems (Impact Factor: 12.179)"
7. " IEEE Internet of Things Journal (Impact Factor: 11.75)"
8. " IEEE Journal on Selected Areas in Communications (Impact Factor: 11.554)"
9. " IEEE Transactions on Cybernetics (Impact Factor: 11.469)"
10. " Medical Image Analysis (Impact Factor: 11.276)"

Literature Review

a. Theories, constructs and concepts (journal articles, textbooks and relevant publications)
- **i.** Describe related theories used to explain issue or theories used to propose a solution to the issue
- **ii.** How were concepts or theoretical constructs defined?
- **iii.** Describe relevance of major theories used to explain the issue

b. Empirical literature (journal articles)
- **i.** Overview of relevant empirical studies done to date
- **ii.** Summary of methodology
- **iii.** What were the major findings of your study?
- **iv.** What were limitations raised regarding findings of the study?

c. Your pathway – based on what you discovered in literature review
- **i.** Whose concept(s) and definition(s) are you going to borrow or use in your own research (if applicable)?
- **ii.** Describe unique aspect(s) of issue that you will be examining
- **iii.** Based on what you read so far, describe method that suits best for your own research

Activity 2: Literature Review

Search for current research on the following topics
- Image spam filter
- Textual spam filter

Try to answer the following questions:

1- What are current problems?

2- What are most commonly used methods/technologies to solve the problem?

3- What is your own proposal?

4- Does your proposal differ from others?

5- Does your proposal provide a better solution?
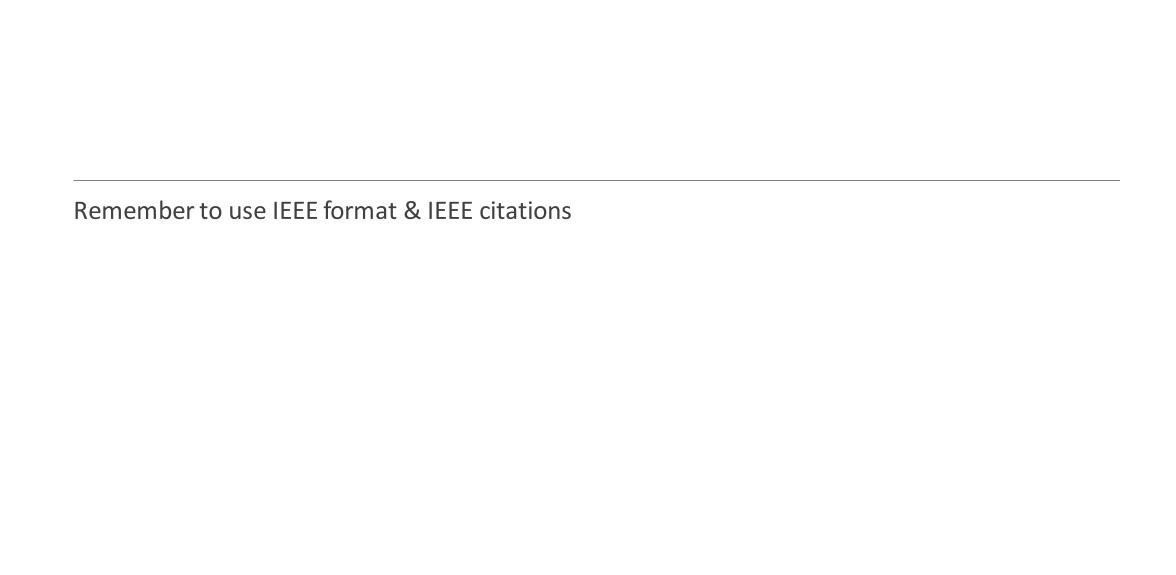
6- Can you do it?

Activity 3:

1. Refer to your assigned project.

Writing a Literature Review based on the following structure:

A. Theories, constructs and concepts (journal articles, textbooks and relevant publications)
  ◦ **i.** Describe related theories used to explain issue or theories used to propose a solution to the issue
  ◦ **ii.** How were concepts or theoretical constructs defined?
  ◦ **iii.** Describe relevance of major theories used to explain the issue

b. Empirical literature (journal articles)
  ◦ **i.** Overview of relevant empirical studies done to date
  ◦ **ii.** Summary of methodology
  ◦ **iii.** What were the major findings of your study?
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c. Your pathway – based on what you discovered in literature review
  ◦ **i.** Whose concept(s) and definition(s) are you going to borrow or use in your own research (if applicable)?
  ◦ **ii.** Describe unique aspect(s) of issue that you will be examining
  ◦ **iii.** Based on what you read so far, describe method that suits best for your own research

Best practice for secondary research (LR)

* Choose a well-known, high-ranking source

* Choose most current work (from last 5 years on)

* Summarize key findings

* Make a comparison & contrast if findings varies

* Evaluate the findings

Remember to use IEEE format & IEEE citations

Homework

* Each person: 5 papers + provide reference material (1 group – 15 papers)

* The team leader collect findings + organize

* Next week, some groups deliver presentations on the literature review

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