



# FDP Session



# STRUCTURED RESEARCH PAPER WRITING

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## Quote

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“The difference between the right word and the almost right word is the difference between lightning and a lightning bug.”

— Mark Twain

# STRUCTURED PAPER WRITING



1. Structured Paper writing.... Why?
2. Research Paper Structure
3. Mandatory parts
4. Optional parts
5. Paper writing sequence



# Paper writing .... Why?

1. To keep record of the work for reference
  - to remember
  - to understand
  - to gain perspective
2. To publish the research findings/outcomes
  - Scientific communication
  - Protection of intellectual property
  - Gain of reputation
  - Knowledge economy (Economic theory of science)

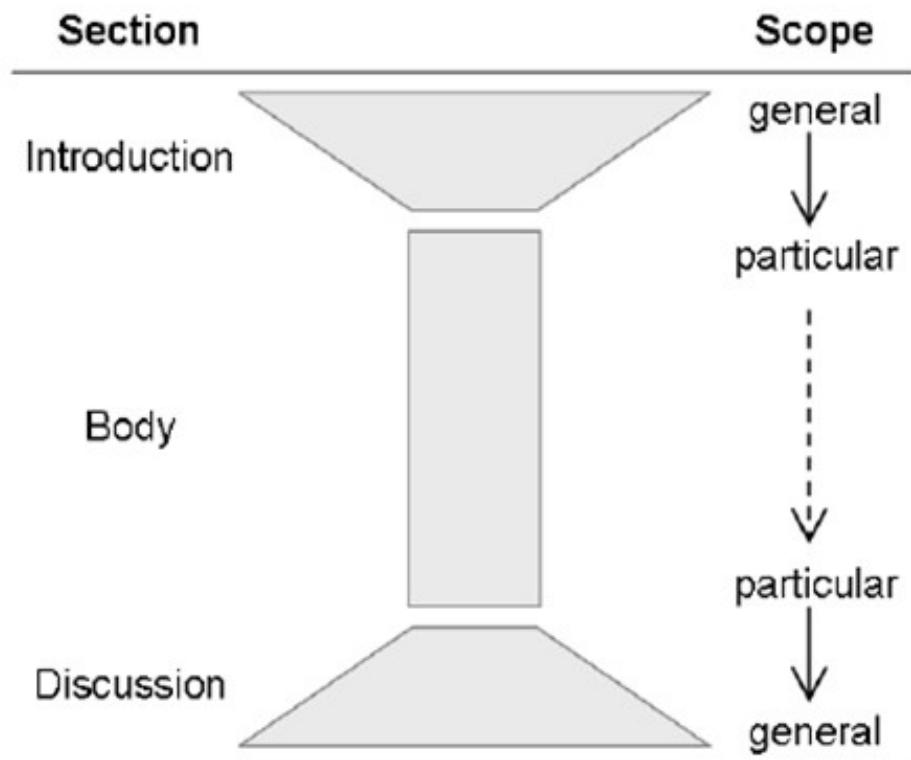
“Sale to achieve high prices”  $\leftrightarrow$  “Publish to achieve many citations”

# Why Structured ?

1. From the Reader's Point of view
  - For better understanding (Novice)
  - For easy literature survey (budding researcher)
  - For easy literature review/comparison/insights
  
2. From the scrutiny point of view
  - For the reviewers (Editorial)
  - For the mentors/guides
  - Measure the contribution to the area
  - Measure the impact of result/method

# Paper Structure

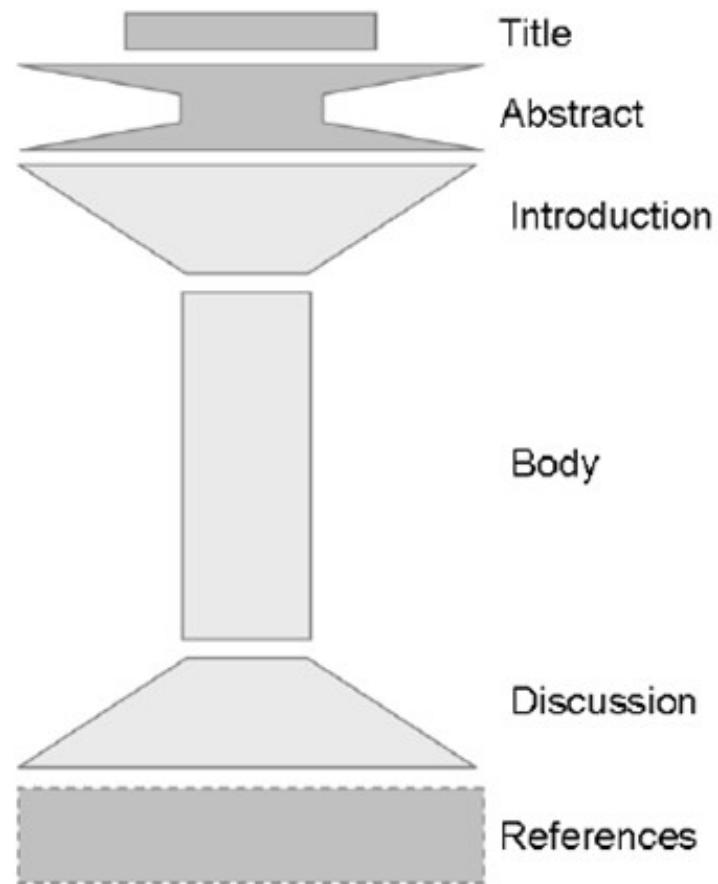
- Basic Model
  - Introduction
  - Body
  - Discussion
  - “hourglass” model



Note: a research paper should be **circular** in argument

# Paper Structure

- Additional parts of a paper
  - Title
  - Abstract
  - References
  - Extended hourglass model



**Note:** This model is called “King” model for its visual resemblance of the chess piece

# Paper - Title

- Read most, and usually read first.
- Good title: “as the fewest possible words that adequately describe the contents of the paper”.
  - Why...? Electronic indexing services rely heavily on the accuracy of the title.
- Long title – waste words.
  - E.g., “Investigations on .....
- Short title – too general words.
  - E.g., Writing Reports....”

# Paper - Title

## How to write effective paper titles?

- Qualities of effective and Good title:
  - Identify the main issue
  - Begin with the subject of the paper
  - Accurate
  - Unambiguous
  - Specific (Unique)

# Paper - Title

- Complete
- Do not contain abbreviations
- Attract readers

E.g.-1: Efficient Task Scheduling algorithm for Multi-processor Architectures

E.g.-2: Online Nearest Neighbor Search Using Hamming Weight Trees

E.g.-3: Order-Preserving Optimal Transport for Distances between Sequences

# Paper - Abstract

- Comprises a one-paragraph summary.
- Increasingly **important** (like a face)- E.g. IEEE.
- So everything **relevant** should be in the abstract, everything else not.
- Two basic types of abstract.
  - An **informative** abstract & an **indicative** or **descriptive** abstract.

# Paper - Abstract

- An **informative** abstract
  - ✓ Objectives, method, results and conclusion
  - ✓ E.g. Original research papers
- an **indicative or descriptive** abstract
  - ✓ Content and outline
  - ✓ E.g. Review/Survey papers

# Paper - Abstract

## Possible contents of informative abstract

1. Motivation: Importance of problem and the results
2. Problem statement: What is the problem and its scope (General or specific approach)
3. Approach: What was done to solve?
4. Results: What is the answer? (avoid hand waving results)
5. Conclusions: What implications?

# Paper - Abstract

Abstract - The objective of Web services technology is to facilitate the creation of reusable and network accessible business applications over the Web for automatic discovery and compositions. With a rapid growth in Web services, finding suitable services for the requesters has become a challenging task. There is a need for an effective Web service publishing and discovery mechanism which explores relevant Web services for the requester. In this paper, the authors present a mechanism makes use of service crawler to publish services and exploits the strengths of functional semantics, keyword matching, structural matching, syntactic matching and semantic matching in order to explore the relevant Web services which satisfy the requester's functional needs. The proposed discovery mechanism is implemented and the experimentation results in 96% Recall rate for XMethods Web service dataset. From the experimentation, we observe that, the proposed Web service publishing and discovery mechanism is effective (5%) in terms of Recall and Precision with reference to the state of the art.

Background

Motivation

Problem

Method

Results

Observations

# Paper - Abstract

## BOEW: A Content-based Image Retrieval Scheme using Bag-of-Encrypted-Words in Cloud Computing

### Abstract:

Content-based Image Retrieval (CBIR) techniques have been extensively studied with the rapid growth of digital images. Generally, CBIR service is quite expensive in computational and storage resources. Thus, it is a good choice to outsource CBIR service to the cloud server that is equipped with enormous resources. However, the privacy protection becomes a big problem, as the cloud server cannot be fully trusted. In this paper, we propose an outsourced CBIR scheme based on a novel bag-of-encrypted-words (BOEW) model. The image is encrypted by color value substitution, block permutation, and intra-block pixel permutation. Then, the local histograms are calculated from the encrypted image blocks by the cloud server. All the local histograms are clustered together, and the cluster centers are used as the encrypted visual words. In this way, the bag-of-encrypted-words (BOEW) model is built to represent each image by a feature vector, i.e., a normalized histogram of the encrypted visual words. The similarity between images can be directly measured by the Manhattan distance between feature vectors on the cloud server side. Experimental results and security analysis on the proposed scheme demonstrate its search accuracy and security.

Background

Motivation

Problem

Method

Results

Observations

Published in: IEEE Transactions on Services Computing ( Early Access )

# Paper - Abstract

## Content-Based Image Retrieval for Medical Image

### Abstract:

In this paper, the SIMPLIcity (Semantics-sensitive Integrate Matching for Picture Libraries), an image retrieval system is introduced. The feature extraction is based on Histogram, color layout and coefficients of wavelet transform. This retrieving system adopts feature database for matching so as to reduce the search space which is especially useful in a larger image database. Retrieval images are selected according to the closest similar measures computed by distance. Under experiments of 600 medical images, this method shows a higher performance of matching. And the similarity defined by  $l_1$  for searching is more suitable for gray images.

Method

Results

Observations

Hand waving

Published in: 2015 11th International Conference on Computational Intelligence and Security (CIS)

Date of Conference: 19-20 Dec. 2015

INSPEC Accession Number: 15758047

# Paper - Abstract

## Content-based image retrieval at the end of the early years

### Abstract:

Presents a review of 200 references in content-based image retrieval. The paper starts with discussing the working conditions of content-based retrieval: patterns of use, types of pictures, the role of semantics, and the sensory gap. Subsequent sections discuss computational steps for image retrieval systems. Step one of the review is image processing for retrieval sorted by color, texture, and local geometry. Features for retrieval are discussed next, sorted by: accumulative and global features, salient points, object and shape features, signs, and structural combinations thereof. Similarity of pictures and objects in pictures is reviewed for each of the feature types, in close connection to the types and means of feedback the user of the systems is capable of giving by interaction. We briefly discuss aspects of system engineering: databases, system architecture, and evaluation. In the concluding section, we present our view on: the driving force of the field, the heritage from computer vision, the influence on computer vision, the role of similarity and of interaction, the need for databases, the problem of evaluation, and the role of the semantic gap.

Outline

Content

Published in: IEEE Transactions on Pattern Analysis and Machine Intelligence ( Volume: 22 , Issue: 12 , Dec 2000 )

# Paper - Abstract

## Note:

1. The abstract should contain a minimum **SIX sentences** representing each component
2. Motivation may proceed with background of **current trends on the research area** (1 to 2 sentences)

# Paper - Abstract

## Note (Contd...)

3. The motivation could be the lack of work in the literature/need for improvement in the existing work/ need of using different approach
  
4. The methodology in the abstract can take more number of sentences in case of Journal publications

# Paper - Abstract

## Don'ts

1. Information and conclusions not stated in the paper
2. References (citations) to other literature
3. Exact title phrase
4. No examples, table and figures
5. Word count: 100-200 (decided by the journal)

# Paper - Abstract

## Summary

Typically, an **informative abstract**, answers these questions in about 100-250 words

1. Why did you do this **study or project**?
2. What did you do, and how?
3. What did you find?
4. What do your **findings mean**?

If the paper is about **a new method or system** the last two questions might be changed to

1. What are the **advantages** (of the method or system)?
2. How well does **it work**?

# Paper - Introduction

## Importance:

- Leads the reader from a general subject area to a particular field of research
- Should guide the reader to current state-of-the-art in the field
- Should allow the reader to understand the rest of the paper

## Three segments

1. Establish a territory
2. Establish a research position
3. Occupy the research position

# Paper - Introduction

## Establish a territory

- a) Bring out the importance of the subject and/or
- b) Make general statements about the subject and/or
- c) Present an overview on current research on the subject.

## Establish a research position

- a) Oppose an existing assumption or
- b) Reveal a research gap or
- c) Formulate a research question or problem or
- d) Continue a tradition (for reviews)

# Paper - Introduction

## Occupy the position

- a) Sketch the **intent** of the own work **and/or**
- b) Outline important **characteristics** of the own work
- c) Outline important **results**
- d) Give a **brief outlook** on the structure of the paper

## Don'ts

- Put information about the **irrelevant subject**
- Criticize the **authors/papers** of literature

## Note

- Can **list the contributions** of the paper (Journal), before the structure (item d).

# Paper - Body

- Reports on the actual research done
- Should be written as an unfolding discussion, each idea at a time
- Mainly answers two questions: How the question is addressed and What was found?
- Body comprises several subsections and the actual structure, organization, and content depends heavily on the type of paper

# Paper - Body

- Generally, the body answers two questions, namely **how** (method) and **what** (result)

## E.g.-1: Empirical/project papers

- Describes the **material and data** used
- **Methodologies** applied to answer the research questions, and the results obtained

# Paper - Body

- **E..g.-2: Case study papers**
  - Application of existing methods, theory or tools
  - The reflections abstracted from the experience and their relevance to other designers or to researchers working on related methods, theories or tools
- **E..g.-3: Methodology papers**
  - Describe a novel method which may be intended for use in research or practical settings
- **E..g.-4: Theory papers**
  - Describe principles, concepts or models on work in the field (empirical, experience, methodology)

# Paper - Discussion

- Discussion & conclusion section is somehow the **counterpart** to the introduction
- Should lead the reader from **narrow** and/or very specific results to more **general** conclusions
- This section includes:
  - Background and recapitulation of the research aims
  - Summary of the **results** with brief discussion
  - Comparison of results with already published work
  - Conclusions or hypotheses drawn from the results with summary of evidence for each conclusion
  - Proposed **follow-up research** questions

# Paper - References

- Embedding the author's work in related literature is one of the essential parts of research writing.
- There are citations of references in the text, as well as a list of cited references at the end of the paper.
- Different formats for citation and listing
  - Name and Year System
    - ✓ Citation: Authors and Year
    - ✓ E.g. Morris and Pratt (2012) defines.....
  - Alphabet-Number System
    - ✓ Citation: using parenthesis or square brackets
    - ✓ Listing: Alphabetical order
    - ✓ E.g. As reported in [4], .....

# Paper - References

- Citation Order System
  - ✓ Similar to alphabet-number system
  - ✓ The reference list is not sorted alphabetically, but in the order of appearance in the text.
- Most widely used styles (Variations of above)
  - Psychological Association (APA)
  - Chicago Style
  - Council of Biology Editors (CBE)
  - Modern Language Association (MLA)
- Computer Science, the most widely used styles are variations of the number system: LNCS, LNAI, LNBI, ACM, IEEE etc.

# Paper – Optional parts

## 1. Author Affiliations

- Describes author name and his associations

### Note:

- Do not use prefix/title for author names
- Do not write designation/post of the author

ACM

## A Tree Structure for Web Service Compositions

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# Paper – Optional parts

Elsevier

## Coupled PermSMBR – Process design and development for 1,1-dibutoxyethane production<sup>☆</sup>

Carla S.M. Pereira\*, Viviana M.T.M. Silva, Alírio E. Rodrigues

LSRE – Laboratory of Separation and Reaction Engineering – Associate Laboratory LSRE/LCM, Faculdade de Engenharia, Universidade do Porto, rua Dr. Roberto Frias, 4200-465 Porto, Portugal

IEEE

Paper Title (*use style: paper title*)

Subtitle as needed (*paper subtitle*)

Authors Name/s per 1st Affiliation (*Author*)

Dept. name of organization (*Line 1 of Affiliation - optional*)  
Name of organization - acronyms acceptable (*line 2*)  
City, Country (*line 3*)  
name@xyz.com – optional (*line 4*)

Authors Name/s per 2nd Affiliation (*Author*)

Dept. name of organization (*Line 1 of Affiliation - optional*)  
Name of organization - acronyms acceptable (*line 2*)  
City, Country (*line 3*)  
name@xyz.com – optional (*line 4*)

# Paper – Optional parts

Springer

## A Late-Fusion Approach to Community Detection in Attributed Networks

Chang Liu<sup>1</sup>, Christine Largeron<sup>2</sup>, Osmar R. Zaïane<sup>1</sup>✉,  
and Shiva Zamani Gharagooshi<sup>1</sup>

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## Other Forms

### A web-based system architecture for ontology-based data integration in the domain of IT benchmarking

Matthias Pfaff <sup>a,b</sup> and Helmut Krcmar  <sup>b</sup>

<sup>a</sup>Department of Business Model and Service Engineering, fortiss GmbH, An-Institut Technische Universität München (TUM), München, Germany; <sup>b</sup>Department of Informatics, Technische Universität München (TUM), München, Germany

# Paper – Optional parts

## 2. Keywords/Index Terms

- Used to facilitate keyword index searches
- Used to assign papers to review committees or editors
- Examples

Springer/other

**KEYWORDS**

*Web Service, E-Learning, E-Learning Discovery, E-Learning Broker & E-Learning Registry*

**Keywords:** Web Services, Compositions, Quality of Service, Service Selection, Broker.

**IEEE**

***Index Terms—Component, formatting, style, styling, insert.  
(key words)***

# Paper - Optional parts

ACM

## Categories and Subject Descriptors

H.3.3 [Information Storage and Retrieval]: Information Search and Retrieval - *Information filtering, selection process.*

H.3.5 [Information Storage and Retrieval]: Online Information Services - *Web-based services.*

## General Terms

Algorithms, Design.

## Keywords

Service Selection, QoS, Composition, Service Offer.

Elsevier

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Keywords: Process intensification; Membrane reactors; Simulated moving bed reactor; Hybrid technologies; 1,1-Dibutoxyethane; Silica membranes; Amberlyst-15

# Paper – Optional parts

## 3. Footnotes

- To present **supplementary information** to reduce the repetition of facts/references.
- References (bibliographic citations) to reliable sources, explanatory information or source information for tables and other elements.

E.g.:

Web services present in various public business registries, Web service registry portals like XMethods<sup>b</sup>, WebserviceX.NET<sup>c</sup>, WebServiceList<sup>d</sup> etc. and other Web sites/portals.

2) *WSDL Downloader*: This module downloads the WSDL files from URLs obtained by the crawler and supplies WSDL files for the publishing (matchmaking) phase and the downloaded files are stored in WSDL repository for future access.

<sup>b</sup> [www.xmethods.com](http://www.xmethods.com)

<sup>c</sup> [www.webservicex.net](http://www.webservicex.net)

# Paper – Optional parts

## 4. Endnotes

4. Much like a footnote, an **endnote** is additional information or credits given at the end of the document (paper, book, article) instead of at the end of each page.
5. Endnotes are commonly marked by a cross-referencing device such as an asterisk (\*), dagger (+), or double dagger (‡), or are numbered.

# Paper – Optional parts

## 5. Acknowledgements

- To thank the project sponsoring agency.
- To thank the professor/industry/institute.

a query as per functional semantics norms (c) Many times, The Web Services and their operations are described in multiple ways.

### ACKNOWLEDGMENTS

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### REFERENCES

- [1] H. Kreger, “Web Services Conceptual Architecture (WSCA.1.0)”, Published May 2001, [online] Available from: [www.ibm.com/software/solutions/webservices/pdf/wsca.pdf](http://www.ibm.com/software/solutions/webservices/pdf/wsca.pdf).

# Paper – Optional parts

## 6. Biography (brief)

- Photograph (passport)
- Name, designation and affiliation
- Qualifications with affiliations to institutions
- Memberships (reputed only and optional)
- Work experience
- Current activity (research/consultancy/teaching)
- Works in the areas related to the paper (optional)
- Specific/important achievements (optional)
- Broad areas of interest

# Paper – Optional parts

## 6. Biography (brief)



**Mehdi Maleki** received the B.Sc. and M.Sc. degrees in electrical engineering from Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran, in 2006 and 2009, respectively. He is currently working toward the Ph.D. degree with The University of Akron, OH, USA. He is also a Research Assistant in wireless communications laboratory (WCL) of the Department of Electrical and Computer Engineering, The University of Akron. He regularly serves as reviewer for IEEE transactions/journals and major conferences. His research interests include digital communications, digital signal processing, multi-user communications, multiple-input multiple-output wireless systems, cooperative communications and cognitive radio networks.

# Paper writing ....Audience?

Be sure of the targeted audience

- PG Students
- Research scholars
- Workshops
- Scientific/Research community

Forum

- Regional Conference
- National Conference
- International Conference
- International Journals

# Writing sequence

1. Body
    - a) Architecture/system model
    - b) Constraints
    - c) Methodology
    - d) Illustrations (optional)
    - e) Experiment setup and Experiments
    - f) Observations
  2. Introduction
  3. Conclusion
  4. Abstract
  5. Title
  6. Keywords and others (like appendix/copyright...)
- Any order & Optional

## Quote

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“I made this letter longer than usual because I lack the time to make it short.”

— Blaise Pascal

# SESSION ENDS

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THANK YOU...

# SESSION ENDS

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Questions...?