



# مركز التدريب والتطوير بالجامعة ورشة عمل بعنوان

## خارطة طريق الأبحاث

### Research Road Map

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# Aim

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- **Research road map is to guide you through the process of conducting a research project.**

# Outline

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- Research Steps.
- Advanced Reading: Practical Ways to Gather and locate Useful Information.
- Interactive Reading: Practical Ways of Knowledge Build-up.
- Interactive Reading Skills.
- Interactive Reading Examples.

# Research Steps

- **Step -1 : Identify a research topic**
  - i. Via research problem approach;
  - ii. Via career development approach;
  - iii. Via personal interest approach;
  - iv. Via your capability approach.

# Research Steps

- **Step-2 : Find out what has been done and identify existing state-of-the art**
  - i. Via advanced reading and literature survey;
  - ii. Via words of mouth and personal contact;
  - iii. Via networking.

# Research Steps

□ **Step-3 : Assess your capability and build up sufficient knowledge, skills and capabilities;**

i. Via interactive readings;

ii. Via attending targeted courses and learning.

**Step -4 : Generate your own ideas;**

i. Advanced readings;

ii. Interactive readings.

# Research Steps

- **Step-5: Draw up a research plan (investigation plan);**
  - i. Follow your objective;
  - ii. Define milestones and expected results;
  - iii. Allocate tasks with respect to time scales;
  - iv. Identify risks and consider your contingency plans.

# Research Steps

- **Step-6: Write your report and consider further research.**
  - i. Writing skills;
  - ii. Further ideas for research and improvements;



# Advanced Reading

Practical Ways to Gather and locate Useful Information

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## 1. Understanding the information sources

- ✓ Search the WEB: <http://www.google.com>
- ✓ Literature search: Web of Knowledge- Web of Science ( By Key words, by authors)- Surveying papers; Research papers.

ISI Web of Science, are subscription-based. Universities and colleges often subscribe to academic search engines. [www.sabha-](http://www.sabha-elibrary.com)

[elibrary.com](http://www.sabha-elibrary.com)

# Advanced Reading

## Resources for Finding and Accessing Scientific Papers

<b>Academic Search Engine</b>	<b>URL</b>	<b>Disciplines</b>
Google Scholar	<a href="http://scholar.google.com/">http://scholar.google.com/</a>	All
Elsevier	<a href="http://www.sciencedirect.com/">http://www.sciencedirect.com/</a>	All
Pubmed	<a href="http://www.ncbi.nlm.nih.gov/pubmed/">http://www.ncbi.nlm.nih.gov/pubmed/</a>	Life sciences
IEEE Xplore	<a href="http://ieeexplore.ieee.org/Xplore/guesthome.jsp">http://ieeexplore.ieee.org/Xplore/guesthome.jsp</a>	Electronics, Electrical engineering, Computer science

# Advanced Reading

## Resources for Finding and Accessing Scientific Papers

<b>Academic Search Engine</b>	<b>URL</b>	<b>Disciplines</b>
National Agricultural Library (AGRICOLA)	<a href="http://agricola.nal.usda.gov/">http://agricola.nal.usda.gov/</a>	Agriculture
Education Resources Information Center (ERIC)	<a href="http://eric.ed.gov/">http://eric.ed.gov/</a>	Education

# Advanced Reading

## List of databases containing free, full-text scientific papers and data sets.

Database	URL	Disciplines
NASA Scientific and Technical Information (STI))	<a href="http://www.sti.nasa.gov/STI-public-homepage.html">http://www.sti.nasa.gov/STI-public-homepage.html</a>	Aerospace
SOA/NASA Astrophysics Data System	<a href="http://adswww.harvard.edu/">http://adswww.harvard.edu/</a>	Astronomy, physics
arXiv	<a href="http://arxiv.org/">http://arxiv.org/</a>	Physics, Mathematics, Computer science, Quantitative biology, Quantitative finance and statistics

# Advanced Reading

## List of databases containing free, full-text scientific papers and data sets.

Database	URL	Disciplines
CiteSeer <sup>X</sup>	<a href="http://citeseerx.ist.psu.edu/">http://citeseerx.ist.psu.edu/</a>	Computer science
Public Library of Science (PLOS)	<a href="http://www.plos.org/search.php">http://www.plos.org/search.php</a>	Life sciences
High Wire Press	<a href="http://highwire.stanford.edu/lists/freeart.dtl">http://highwire.stanford.edu/lists/freeart.dtl</a>	Life sciences

# Advanced Reading

Practical Ways to Gather and locate Useful Information

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## 2. Understanding the information quality

- ✓ Follow top quality journals only;
- ✓ Follow giants only;
- ✓ Follow professional organization WEB sites.

## 3. Understanding the contents

- ✓ WEB search: Download source codes;
- ✓ Academic Reading: challenging tasks  
(Selective Reading);

# Advanced Reading

Practical Ways to Gather and locate Useful Information

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- ✓ Read textbooks;
- ✓ Read the abstracts;
- ✓ Read the introduction;
- ✓ Read conclusions;
- ✓ Read experimental results;
- ✓ Dealing with references.

# Advanced Reading

Practical Ways to Gather and locate Useful Information

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## 4. Implementation of your advanced reading

- ✓ Read the title to narrow the search down to abstracts;
- ✓ Read abstracts to identify useful papers for full text access ( by useful, we mean understandable and implementable, see next slide);
- ✓ Grouping papers into manageable level.



# Advanced Reading

Practical Ways to Gather and locate Useful Information

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## 5. What you are looking for?

- ✓ Understandable algorithms and methodologies, with which (i) you can get inspired to generate new ideas; (ii) you can learn new things and build up your knowledge in a research field;
- ✓ Implementable techniques, research platforms;
- ✓ Source codes with which you can build up your own work and start your own research.

# Interactive Reading

Practical Ways of knowledge Build-up

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## 1. Modes of interactive via Iterative Reading:

### ✓ Analysis and Synthesis:

reading individual section is equivalent to the process of analysis, and summarization of what you read in your own words is equivalent to the process of synthesis;

### ✓ Iterations:

Read each paper in four times on average, and build up your knowledge iteratively – 5%, 20%, 60%, more?

# Interactive Reading

Practical Ways of knowledge Build-up

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## 2. Process of Iterative Reading via Construction of a Flow-chart of Blocks:

### □ 1 st time Reading:

- What is the paper generally talking about?
- What is the methodology proposed?
- How are the experiments designed?
- What results are achieved? Are they significant and useful for your research?
- Can you outline the structure of the flow-chart?

# Interactive Reading

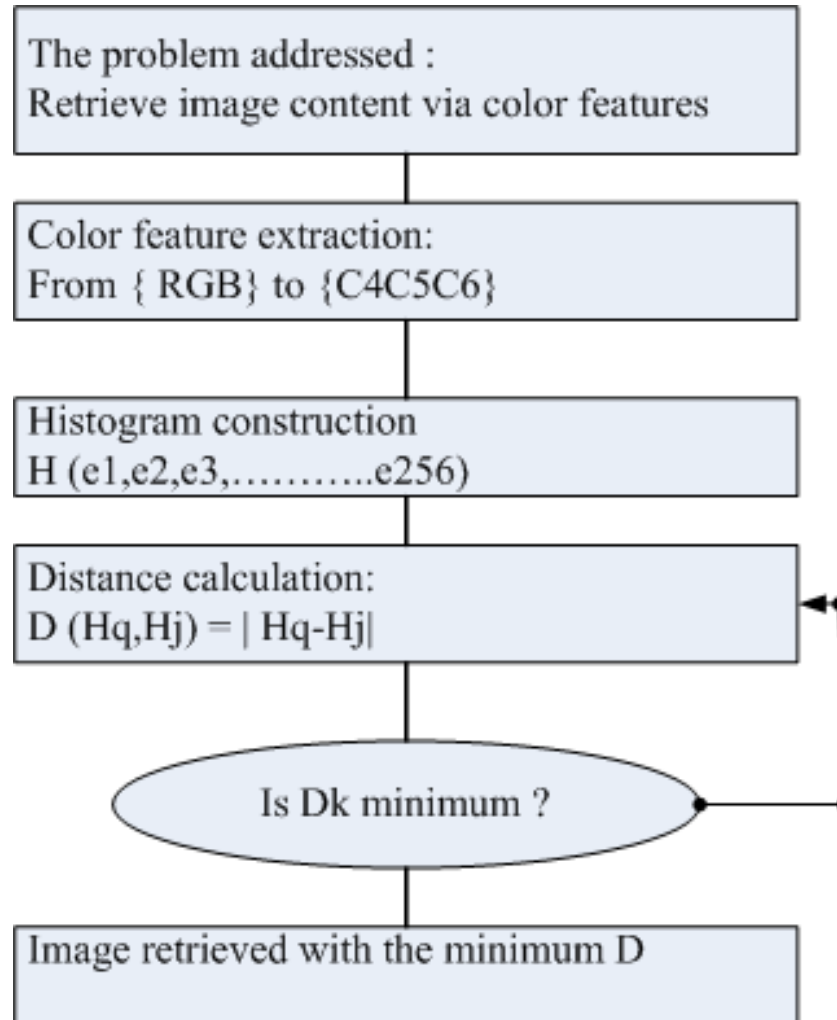
Practical Ways of knowledge Build-up

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**Note : While reading a paper, take every sentence as the minimum unit and try to interpret what is being described. NEVER STOP AT THOSE UNKNOWN TERMINOLOGIES, Carry on reading until you reach the end of the paper!**

# Interactive Reading

an example of the flow- chart



# Interactive Reading

Practical Ways of knowledge Build-up

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□ **2nd time Reading:** strengthen your understanding via:

- Supporting your claim
- Put pieces together
- Known more about the paper
- Gathering further information and preparation

# Interactive Reading

## Practical Ways of knowledge Build-up

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- **3rd time Reading:** selective reading to get yourself into the details of the work:
  - To repeat the work
  - Add details to the blocks- work out mathematical equations.
  - Generate new ideas for your research.

# Interactive Reading

## Practical Ways of knowledge Build-up

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- **4th time Reading: Conclusive reading:**
  - Can I repeat the work?
  - What is the value of the work, novelty, usefulness, and impact?
  - Can I generate any idea to advance the work further?

**You do not need 100% understanding to build up your knowledge and carry out your own research.**



# Interactive Paper Reading Skills

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- ❑ Reading in terms of sentences rather than words;
- ❑ Reading abstracts to make decisions:
  - what the research problem is ?
  - is it relevant to my research?
  - should I read further?

# Interactive Paper Reading Skills

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- Reading introductions:
  - what is the research background?
  - what is the state-of-art?
  - what is the weakness of the existing work?
  - how to write introduction? (can I learn?)
  - how to cite references?

# Interactive Paper Reading Skills

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- ❑ Reading algorithm design, the main body of the paper:
  - ✓ what mathematics do I need?
  - ✓ what textbook should I read in order to understand the work?
  - ✓ any further references which might be helpful?
  - ✓ how to write and describe my own work?
  - ✓ how to present and justify my points?

# Interactive Paper Reading Skills

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- ❑ Reading experiments:
  - ✓ how to write experiments section
  - ✓ three important ways of presenting experimental results ( graphs, tables, and samples)
  - ✓ how to design experiments?
  - ✓ how to justify the experiments design ?
  - ✓ how to analyses the experimental results?
  - ✓ how to argue your case and support your work.

# Interactive Paper Reading Skills

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- ❑ Reading conclusions:
  - ✓ how to write conclusions
  - ✓ identify further research
  - ✓ decide to follow up
  - ✓ think about your next step for research

# Interactive Paper Reading Skills

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- ❑ Summarise your benefits on reading a paper:
  - ✓ inspired to generate new ideas for your own research?
  - ✓ repeatable so the work can be taken as a block box or tools for your future research?
  - ✓ writing skills?
  - ✓ useful knowledge?

# Interactive Reading Examples

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## □ Example-1

**Paper Title:** Robust image watermarking via geometrically invariant feature points and image normalization.

**General Comments:** A very good selection, which reflects both quality (Well-known publisher, journal publication) and timeliness ( published in 2012)

# Interactive Reading Examples

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## □ Example-2

**Paper Title:** Building an E-business strategy for mainland Chain

**General Comments:** No information about the source of this article, which suggest a web page, or a non- recognized publication (quality) ?



# Interactive Reading Examples

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## ❑ Example-3

**Paper Title:** Tricks to animating characters with a computer

**General Comments:** This is conference tutorial article. The quality is good ( International reputable conference). But the article may be a bit too old to ensure that it reflects the leading-edge technology (1994).



# The End

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**Thank you for your attention**

**Questions?**