《Professional Reading and Writing》
How to read a paper

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Types of Publication

Timely

Technical Reports

Conference Papers

Journal Papers

Book Chapters

Trust

Content Types

Theoretical Paper

System Paper

Survey Paper

A Typical Researcher …

- Will likely spend **hundreds of hours every year** reading papers ☺

- A "good" graduate student /researcher should read (in average) ***a paper a day***!

Why?

- You were asked to ☺

- For a literature survey of a new field/problem
- Be up-to-date on current research in the field
- Gives you “pre-digested” thoughts
- Allows you to replicate/extend the results
- Teaches you how to write
- Review for a conference or a class
- ….

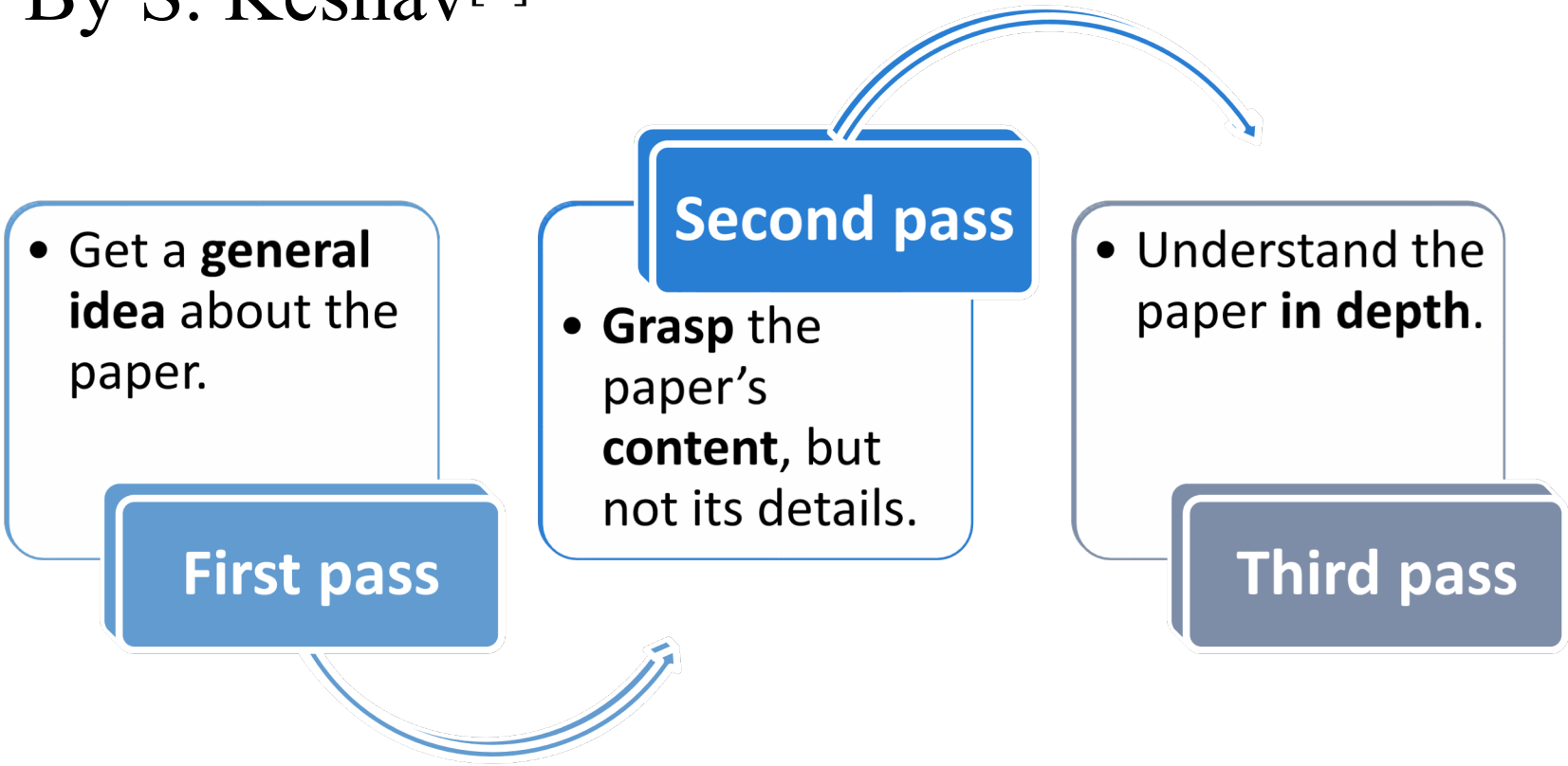
Many ways to read papers

1. S. Keshav, *How to Read a Paper*, 2007/2016

2. Philip W. L. Fong, *Reading a Computer Science Research Paper*, SIGCSE 2009

Three-Pass Approach

- By S. Keshav[1]



[1] S. Keshav, "How to Read a Paper," *ACM SIGCOMM Computer Communication Review* 37(3) : 83-84, July 2007.

The 1st Pass

A **quick scan** to get a bird's-eye view of the paper (5-10 mins).

1. Carefully read the **title**, **abstract**, and **introduction**
2. Read the **section and sub-section *headings***, but ignore everything else
3. Read the **conclusion**
4. Glance over the **references**, mentally ticking off the ones you've already read

At the End of this Pass …

1. **C**ategory: What type of paper is this?
   - A theoretical paper?
   - A system paper ?
   - A survey?
2. **C**ontext: What is the problem (space)? Which other papers is it related to?
3. **C**orrectness: Do the assumptions appear to be valid?
4. **C**ontributions: What are the main contributions?
5. **C**larity: Is the paper well written?

The 2nd Pass

Read with greater care (up to 1 hour)

1. Look carefully at the **figures**, **diagrams** and other **illustrations** in the paper.
2. **Mark relevant unread references** for further reading
3. Ignore proofs, extensions, and appendix

At the End of this Pass …

1. Summarize the content of the paper
2. Being able to explain the main ideas of the paper to someone else

- You might not understand the paper, and the reason might be that it is badly written

The 3rd Pass

Attempt to virtually re-implement the paper (up to 4-5 hours)

1. Make the same assumptions as the authors
2. Re-create the work, re-prove the results, ...
3. Think about how you yourself would present a particular idea
4. Compare this re-creation with the actual paper
5. Challenge every assumption

At the End of this Pass …

1. **Reconstruct** the entire structure of the paper from memory.
2. Identify its **strong and weak points**.
3. Identify hidden failings and assumptions
4. Derive new ideas for future work

Example

- Suppose you want to read the following paper：

  BRAVO: Improving the Rebalancing Operation in Bike Sharing with Rebalancing Range Prediction
  Shuai Wang, Tian He, D. Zhang, Y. Shu, Y. Liu, Y. Gu, C. Liu, H. Lee and S. Son.
  Ubicomp'18, Singapore, 2018. **(CCF A)**

Example: 1st pass

- **0** Title, Author List
- **1** Abstract
- **2** Introduction
- **3** Preliminary/Background
- **4** Motivation
- **5** Design
  - Overview
  - The Key Idea
  - Demand Analysis
  - Safe Rebalancing Range
  - Target Station & Rebalancing Amount

Example: 1st pass

- **6 Evaluation**
  - **Implementation and Field Test**
  - **Long Term Data Driven Evaluation**
- 7 Related Work
- 8 Conclusion

At the End of this Pass …

1. Category: System paper
2. Context:
   - Bike sharing
   - Rebalancing
3. Correctness: yes
4. Contributions:
   - Demand Prediction
   - Optimal Data Driven Rebalancing Scheduling
5. Clarity: yes

Example: 2nd pass

1. Read Details
   - Illustrations
   - Figures
   - Diagrams and others
2. Summarize the content of the paper
3. Being able to explain the main ideas of the paper to someone else

Example: 3rd pass

- Critical thinking
- Ask questions

Homework 3

- Choose 3 Top papers, translate the titles and abstracts; Choose one of them and write down your understanding
- Or translate the titles and abstracts of the following 3 papers; Choose one of them, read the paper and explain your understanding
  - **Understanding User Behavior in Car Sharing Services Through The Lens of Mobility: Mixing Qualitative and Quantitative Studies**.
  - **Data-Driven Fairness-Aware Vehicle Displacement for Large Scale Electric Taxi Fleets**
  - **SCLoRa: Leveraging Multi-Dimensionality in Decoding Collided LoRa Transmissions**
- Submit it before the next class

作业3 (同上，中文表述)

- 选择三篇你感兴趣的前沿顶尖论文，翻译其题目和摘要，并阅读其中一篇全文讲讲你的理解
- 或者翻译以下3篇论文的题目和摘要并阅读其中一篇全文讲讲理解
  - **Understanding User Behavior in Car Sharing Services Through The Lens of Mobility: Mixing Qualitative and Quantitative Studies.**
  - **Data-Driven Fairness-Aware Vehicle Displacement for Large Scale Electric Taxi Fleets**
  - **SCLoRa: Leveraging Multi-Dimensionality in Decoding Collided LoRa Transmissions**
- 下次上课前提交

Discussions

- Talking about your understanding of different areas in computer science

Discussion about homework 2

- 根据CCF推荐列表中计算机各个子方向
  - 选择一个你喜欢的子方向
  - 对该子方向进行科普性调研
- 确定子方向后，选择你认为最合适的
  1. 一篇近两年有意思的高水平论文
  2. 一个相关高水平会议
  3. 一个相关高水平期刊
  4. 一位相关领域专家
- 并给出选择的理由

Discussion about homework 2

- 整理文档，提交如下内容
  1. 选择的子方向名称及对该方向的认知总结
  2. 论文信息（以参考文献格式）
  3. 会议名称和网站链接
  4. 期刊名称和网站链接
  5. 专家名字和主页链接
  6. 上述5个选择的简要理由