HOW TO READ
AN ACADEMIC PAPER

Dr. Weipeng Xu, MPI-INF
What we’re going to cover

1. **Why** do we read academic papers?
2. **What** is the nature of academic papers?
3. **How** to read a paper?
What we’re going to cover

1. **Why** do we read academic papers?
2. **What** is the nature of academic papers?
3. **How** to read a paper?
The research process

- Understand other people's research
- Do your research
- Write up your research

Papers

Dr. Weipeng Xu — How to read an academic paper
The research process

Understand other people’s research

Do your research

Write up your research

Papers
Why read papers?

- Understand other people’s research
  - Understand the context of a research area
  - Keep up-to-date with a field
  - Learn techniques used in a particular research area

- Do your research
  - Inspire your ideas
  - Help formulate your own research problems
  - Solve specific problem

- Write up your research
  - See good/bad writing and good/bad research
  - Related works/references
What we’re going to cover

1. **Why** do we read academic papers?
2. **What** is the nature of academic papers?
3. **How** to read a paper?
The nature of academic writing

papers → surveys → textbooks

postgraduate degree and research

good high school and undergraduate degree
The nature of papers

Good research
• Correct
• Important
• Well written

Poor research
• Wrong
• Unimportant
• Incomprehensible

Vs.
The peer-review process

1. Paper submitted to Conference or Journal
2. Reviewer #1, Reviewer #2, ..., Reviewer #N provide feedback
3. Consensus reached:
   - Accept
   - Revise
   - Reject
The nature of papers

Good research

• Correct
• Important
• Well written

• Apply critical judgement
• Ask questions as you read
Questions to ask

- What are the researchers trying to find out?
- Why is the research important?
- What things were measured?
- What were the results?
- What do the authors conclude and why?
- Can I accept the findings as true?
Why publish?

- primarily to communicate:
  - new ideas and theories
  - solutions to existing and new problems
  - combinations of existing and new components (systems)
  - organise works on some topic (surveys, text books)

- but also (to a lesser extent):
  - for (a sense of) achievement
  - to travel to new places and meet new people
  - to further one’s academic career
  - get well known for your work
Publication venues

- conference papers
- journal articles
- posters
- workshop papers
- arXiv
- technical reports
- dissertations
- book chapters
- text books
Where to find papers

- Google / Google Scholar
- arXiv
- CiteSeerX
- DBLP
- CVF website (CVPR, ICCV)
- Ke-Sen Huang’s website (SIGGRAPH, EG, etc.)
- authors’ websites
- institutional repository

- digital libraries:
  - ACM Digital Library (SIGGRAPH, TOG …)
  - IEEE Explore (ICCV, CVPR, PAMI…)
  - SpringerLink (ECCV, IJCV…)
  - Wiley Online Library, Elsevier ScienceDirect, …

- traditional libraries:
  - Campus-Bibliothek für Informatik und Mathematik
  - Saarländische Universitäts- und Landesbibliothek (SULB)
  - Deutsche Nationalbibliothek
  - Google Books
What we’re going to cover

1. **Why** do we read academic papers?
2. **What** is the nature of academic papers?
3. **How** to read a paper?
Parts of a paper

- title
- teaser
- abstract
- introduction
- related work
- overview
- methods
- results
- discussion
- conclusion
- references
- appendices
- supplemental material:
  - images, videos
  - supporting documents
Reconstructing Detailed Dynamic Face Geometry from Monocular Video
[Garrido et al., SIGGRAPH Asia 2013]
How to read a paper (by S. Keshav)

- Suggested approach for efficient reading
- Make up to three passes over the paper:
  1. quick pass:
     - get general idea about the paper
  2. content pass:
     - grasp paper contents, but skip details
  3. details pass:
     - understand the paper in depth
How to read a paper – Pass 1

- quick scan to get a bird’s-eye view of the paper
- decide whether you need to do any more passes
- should take about 5–10 minutes:
  1. carefully read title, abstract and introduction
  2. read headings, but ignore everything else
  3. look at the maths (if any)
  4. read conclusion
  5. glance over the references
- Tip: read the figures (teaser, method overview, results, tables..)
How to read a paper – Pass 2

- read the paper with greater care, but ignore details (1h)
- it helps to make notes in the margins as you read
- look carefully at figures, diagrams and other illustrations
- this level of detail is appropriate for an interesting paper outside your research speciality
- if you still don’t understand a paper, you can choose to:
  a) set the paper aside
  b) return to the paper later
  c) go on to the third pass
How to read a paper – Pass 3

- the key is to attempt to virtually re-implement the paper:
  - make the same assumptions as the authors, re-create the work.
  - compare your re-creation with the actual paper

- this pass requires great attention to detail

- identify and challenge every assumption

- should be able to identify strong and weak points:
  - implicit assumptions
  - missing citations to relevant work
  - potential issues with experimental or analytical techniques
Remember what you read

- organise papers to keep track of them:
  - Mendeley: free online reference manager with social network
  - Zotero: free (open-source) desktop reference manager
  - EndNote: paid reference manager
  - BibTeX file

- minimum paper details:
  - authors, title, venue, year, keywords, abstract

- write a brief summary:
  - problem(s), solution(s), results, future work
Conclusion

- Papers are used to communicate research
- Don’t expect all papers to be totally correct and well written
- 3 pass manner
- Think when reading
- Don’t get frustrated if you don’t understand anything
QUESTIONS?