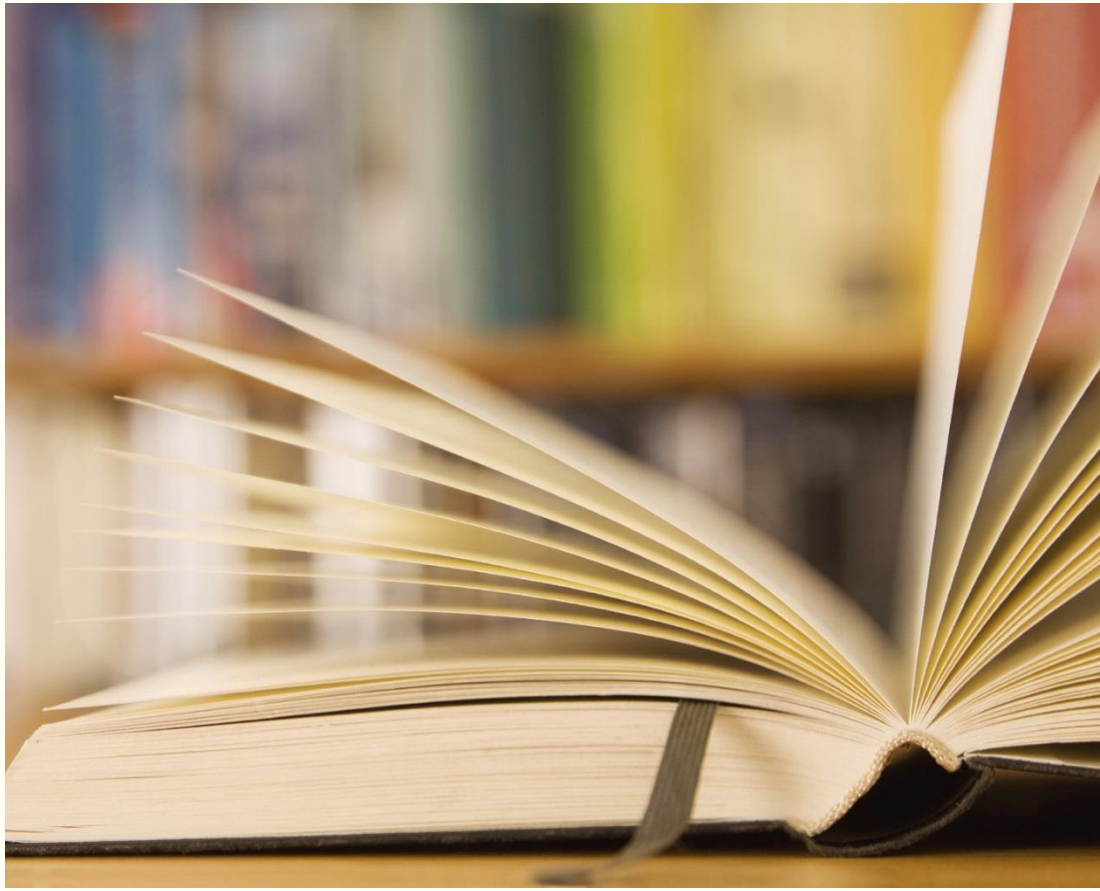
How to read
an academic paper

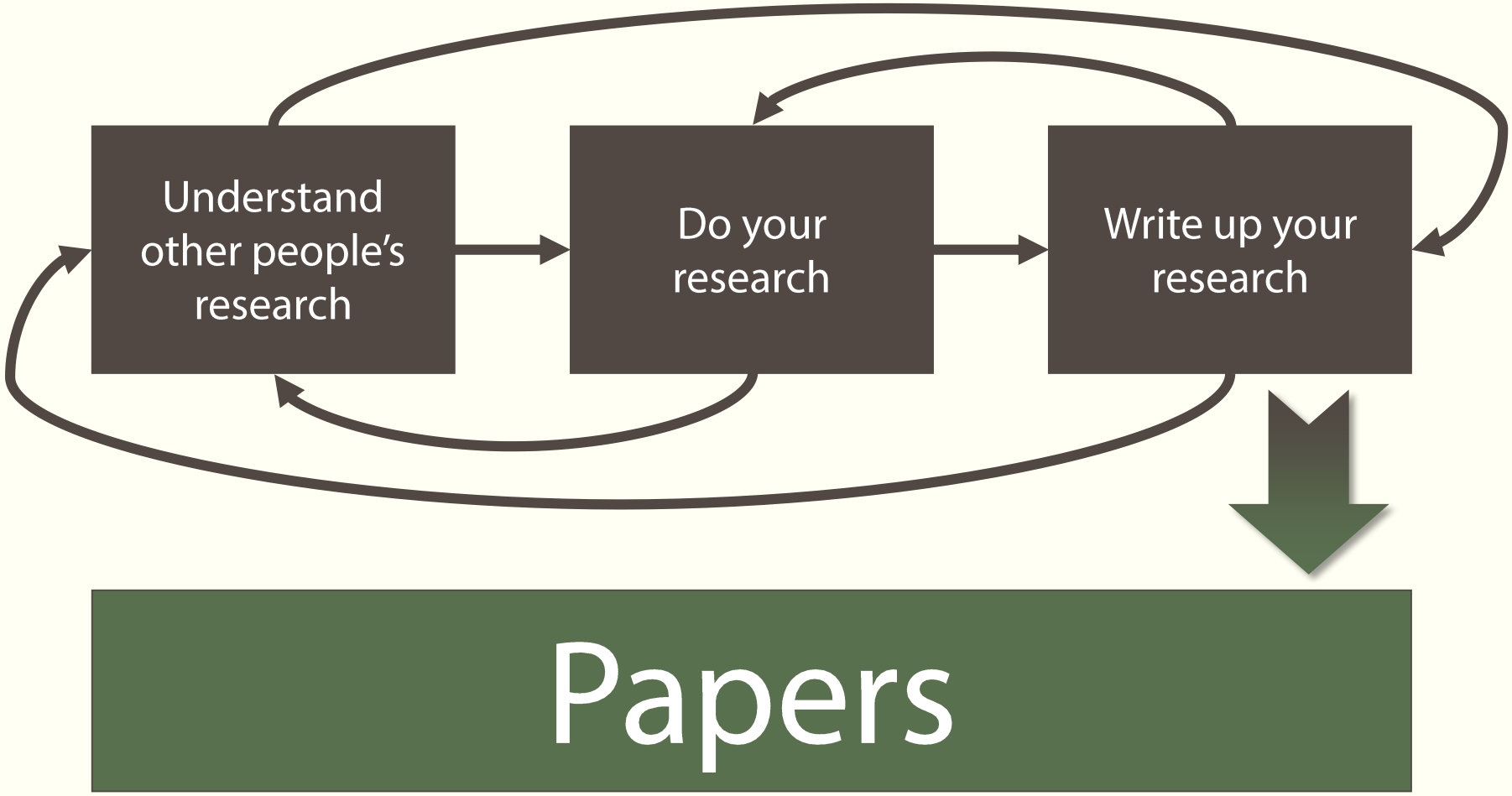
Dr. Christian Richardt, Intel VCI/MPI-INF



What we're going to cover

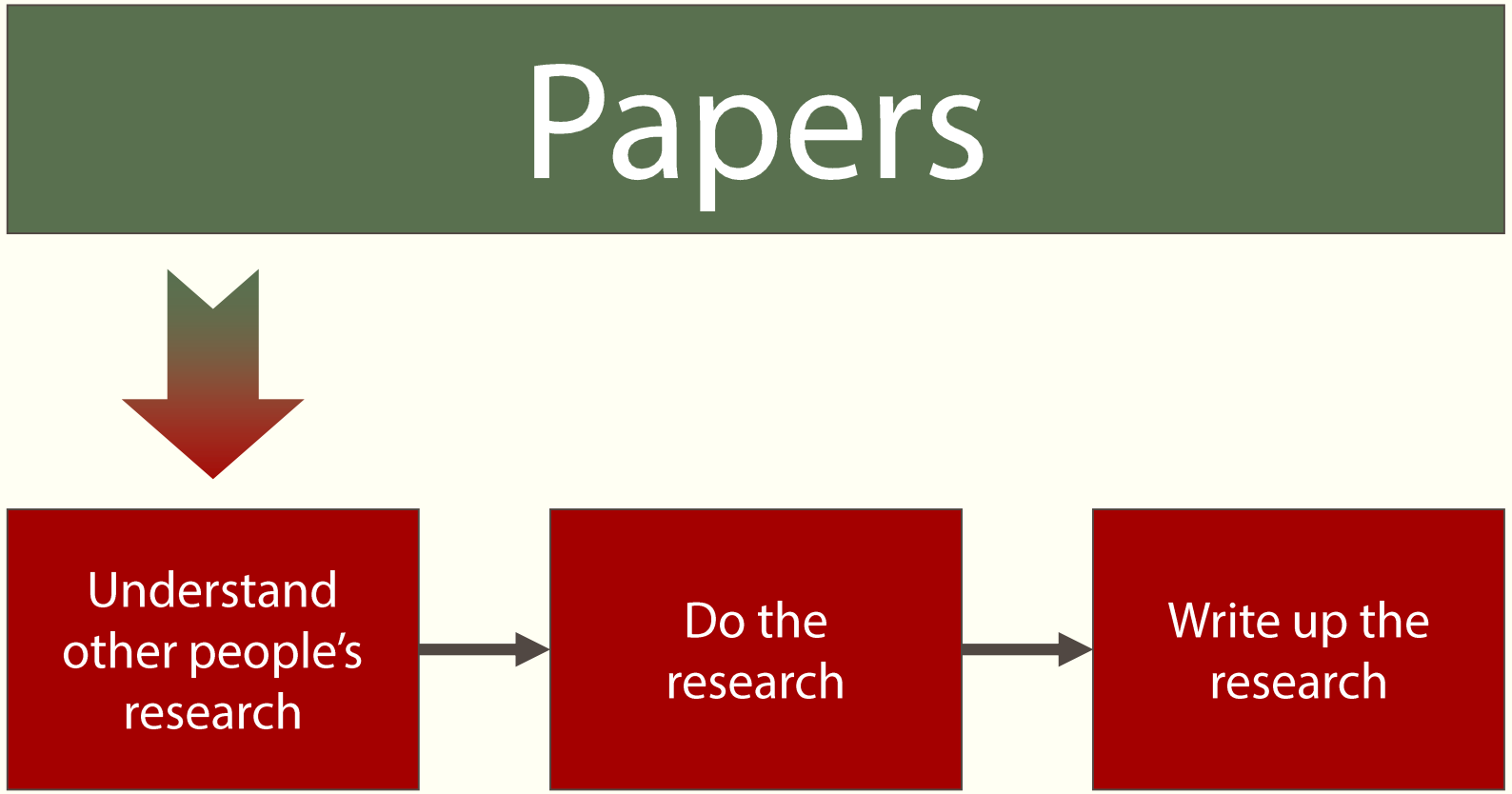
1. Research process
2. Nature of academic writing
3. Questions to ask
4. About publications
5. How to read a paper

The research process



Slide: Neil Dodgson

The research process



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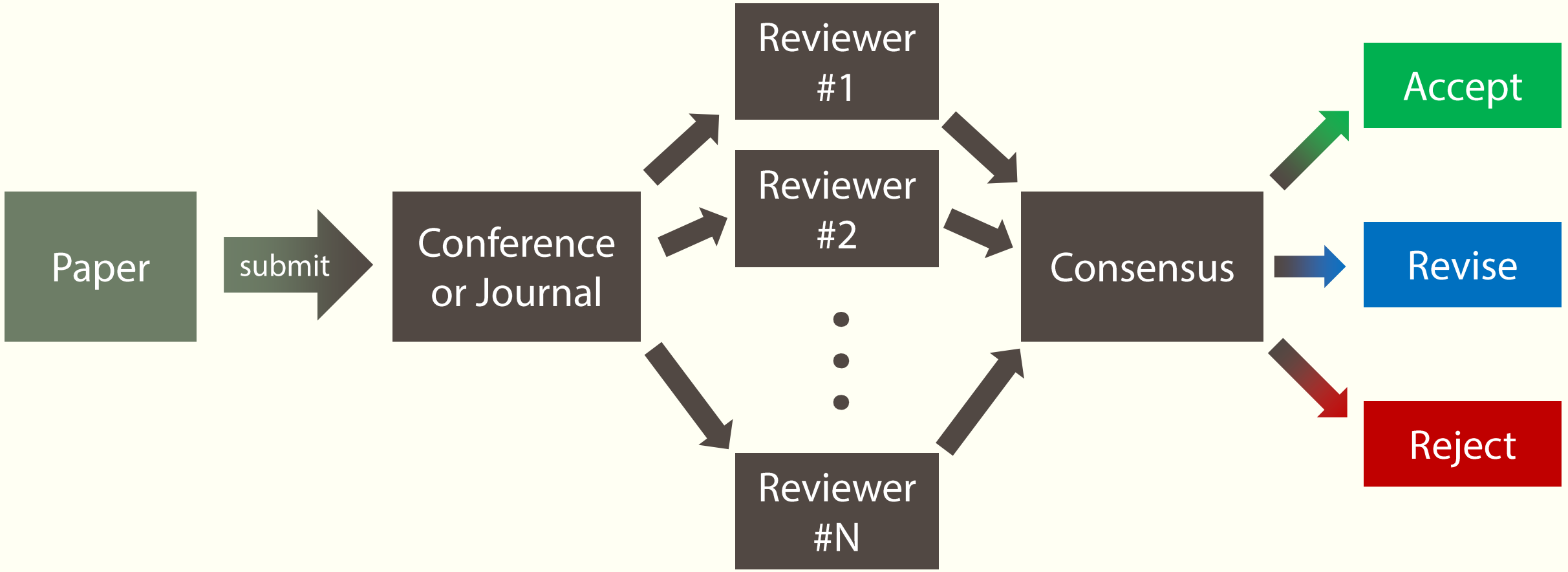
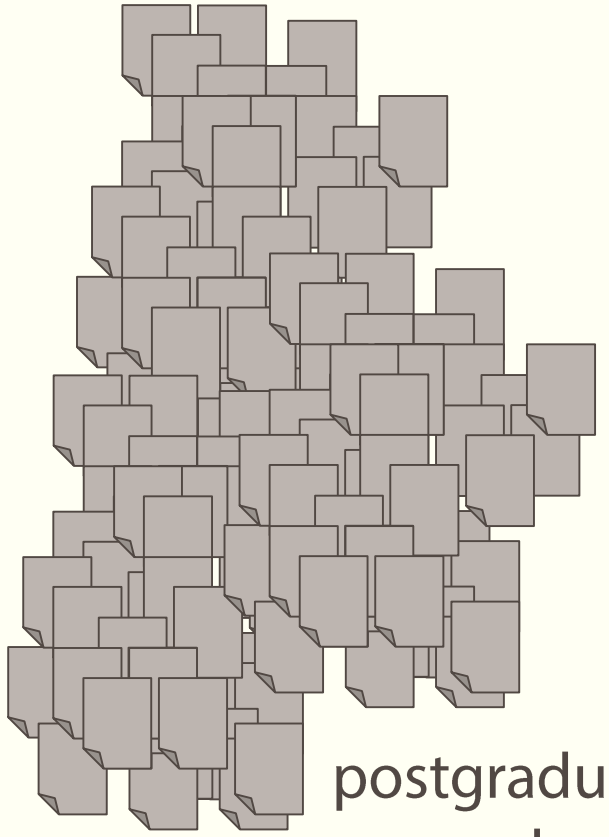
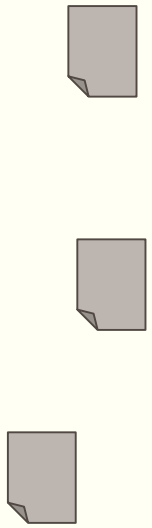
The peer-review process



The nature of academic writing

papers → surveys → textbooks





postgraduate degree and research

high school and undergraduate degree

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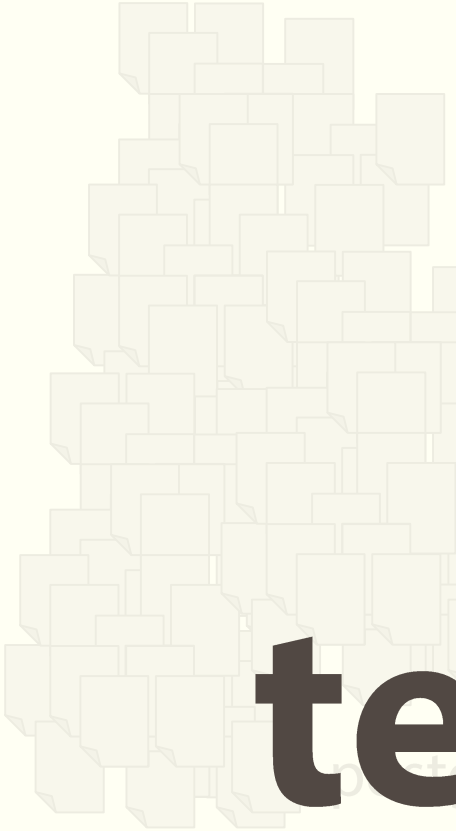
papers → surveys → textbooks



papers are not text books

postgraduate degree and research

high school and undergraduate degree

Slide: Neil Dodgson

The nature of papers

- Good research
- Correct

} Apply critical judgement
Ask questions as you read

- Important

} Choose the right
papers to read

- Well written

Slide: Neil Dodgson

Questions to ask

- Do I need to read this?

- 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?

Slide: Neil Dodgson

Why publish?

- primarily to communicate:
  - new ideas and theories
  - solutions to existing and new problems
  - combinations of existing and new components (systems)
  - organise work 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

Why read papers?

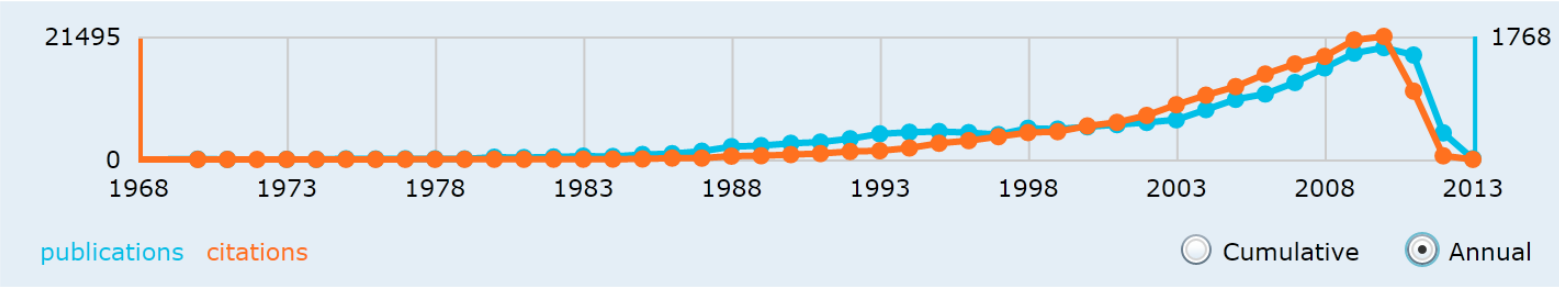
- specific problem to solve
- keep up-to-date with a field
- understand the context of a research area
- help formulate our own research problems
- see good/bad writing and good/bad research
- learn techniques used in a particular research area

Exponential growth of publications

Computer Vision - CV

Publications: 18,672 | Citation Count: 218,721

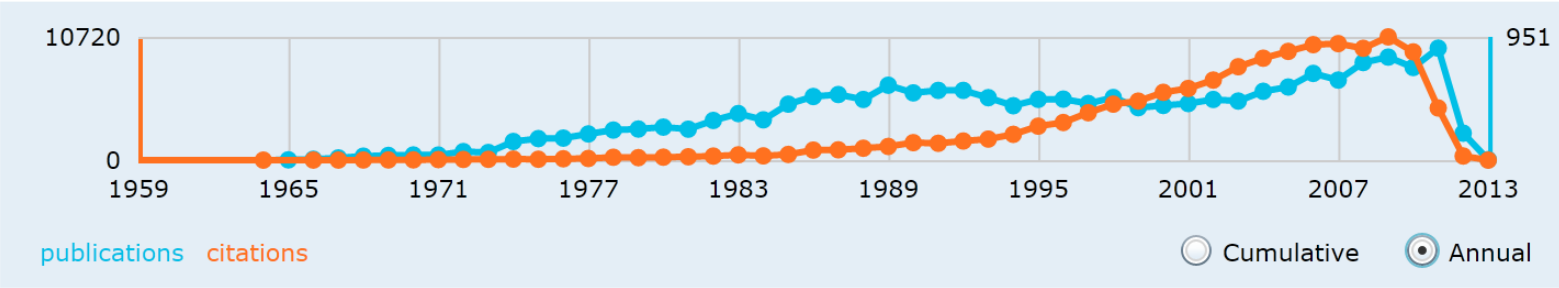
Stemming Variations: computational vision, computer visions, Computing Vision, Computation Vision, Comput Vision



Computer Graphic

Publications: 19,226 | Citation Count: 163,699

Stemming Variations: computer graphics, computation graphics, computation graphical, computers graphic, computer graphical



Source: Microsoft Academic Search

Publication venues

- posters
- technical reports, memos
- workshop papers
- conference papers
- journal articles
- book chapters
- dissertations
- text books
- one can lead to another
  - work-in-progress poster before main publication
  - extended conference paper as journal article
  - etc.

Where to find papers

- Google Scholar
- CiteSeerX
- DBLP
- CVF website (CVPR, ICCV)
- Ke-Sen Huang's website (SIGGRAPH, EG, EGSR)
- authors' websites
- institutional repository

- digital libraries:
  - ACM Digital Library
  - IEEE Explore
  - SpringerLink, Wiley Online Library, Elsevier ScienceDirect, …
- traditional libraries:
  - Campus-Bibliothek für Informatik und Mathematik
  - Saarländische Universitäts- und Landesbibliothek (SULB)
  - Deutsche Nationalbibliothek
  - Google Books

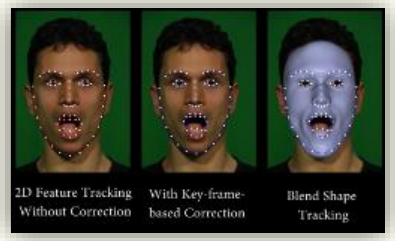
Parts of a paper

- title
- teaser
- abstract
- introduction
- related work
- overview
- methods
- results
- discussion
- conclusion
- references
- appendices
- supplemental material:
  - images, videos
  - supporting documents

Parts of a paper (example)

Reconstructing Detailed Dynamic Face Geometry from Monocular Video
[Garrido et al., SIGGRAPH Asia 2013]

supplemental document



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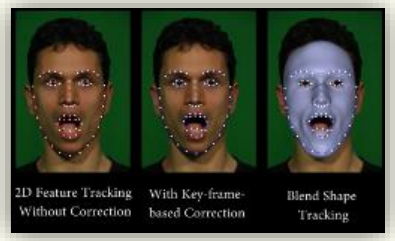

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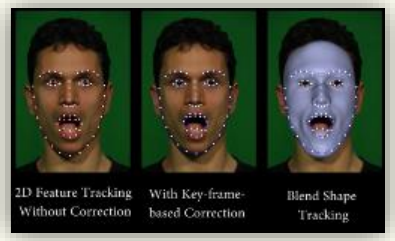

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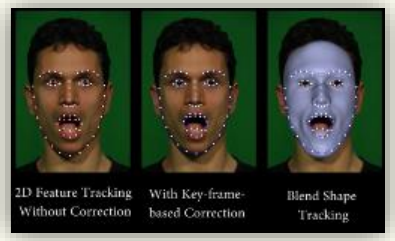

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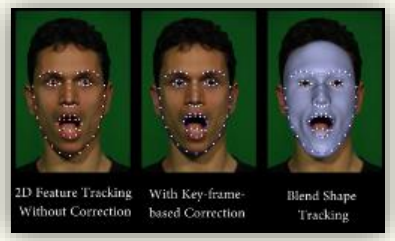

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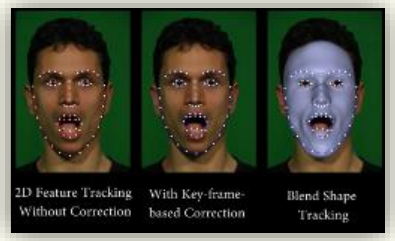

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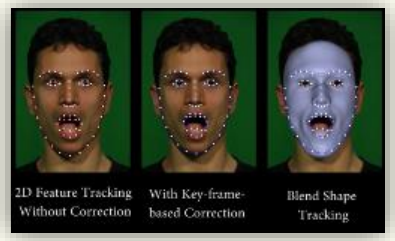

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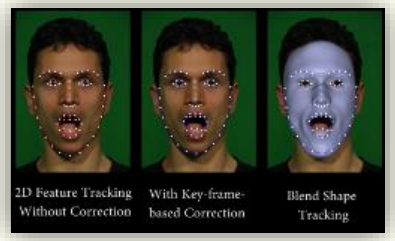

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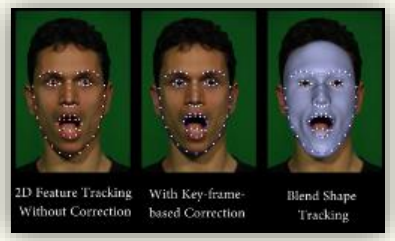

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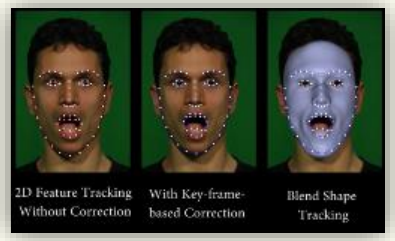

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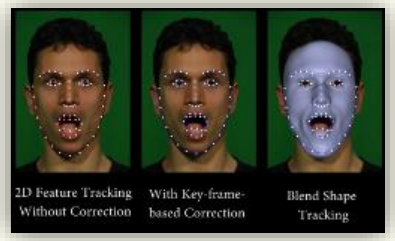

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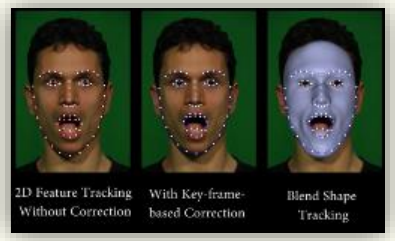

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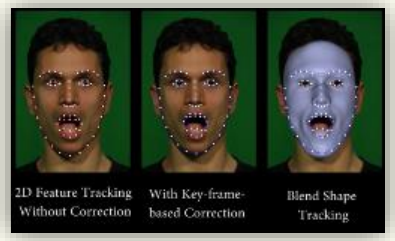

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How to read a paper (by S. Keshav)

- 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

Source: S. Keshav

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

Source: S. Keshav

How to read a paper – Pass 2

- read the paper with greater care, but ignore details
- 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) persevere and go on to the third pass

Source: S. Keshav

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

Source: S. Keshav

Doing a literature survey

- find 3–5 recent, highly-cited papers using keyword search
- do a quick pass on them
  - to get a sense of the work
- read related work
  - good summary of recent work
- find shared citations and repeated author names
  - = key papers and researchers in that area
  - download & put aside
- go to researcher websites
  - see where they've published recently
  - = top conferences and journals
- go to websites of top conferences
  - look through recent proceedings
  - find recent, high-quality related work
- make two passes through all collected papers
  - add any missing papers that are referenced repeatedly
  - and iterate

Source: S. Keshav

Remember what you read

- organise papers to keep track of them:
  - BibTeX file: e.g. using JabRef
  - Mendeley: free online reference manager with social network
  - Zotero: free (open-source) desktop reference manager
  - Papers for Mac, iOS, Windows: paid desktop/mobile reference manager
- minimum paper details:
  - authors, title, venue, year, page numbers, keywords, abstract
- write a brief summary:
  - problem(s), solution(s), results, future work

Questions?