# Scientific writing and bibliographic research

#### Week 2

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Sources

#### Kinds of sources

- Primary sources (e.g. research data)
  - Raw data, historical documents, archeological artifacts
  - Not analyzed or interpreted
  - Example: experimental observations
- Secondary sources
  - Based on primary data
  - Interpretations, evaluations, analysis
  - Examples: research reports, monographs, articles
- Tertiary sources
  - Based on secondary sources
  - Collection or distillation of information (e.g. overview about a whole research area)
  - Examples: encyclopedias, handbooks, textbooks, bibliographies, catalogs
- Other sources: webpages, blogs, newspapers, talks, ...

# **Tertiary sources: Overview**

- Help getting access to a field of study (e.g. Textbooks, Handbooks)
- Contents can be considered general knowledge in the field
- But: include references to important secondary sources (especially catalogs, bibliographies)
- Good starting point for a broad literature search

# **Tertiary sources: Handbooks and Textbooks**

#### Handbooks

- Compress first-rate information in short articles
- Offer a long list of references
- Can be hard to swallow

## Textbooks

- Are written with an audience of students in mind
- Explain in greater detail
- Reading can be time-consuming

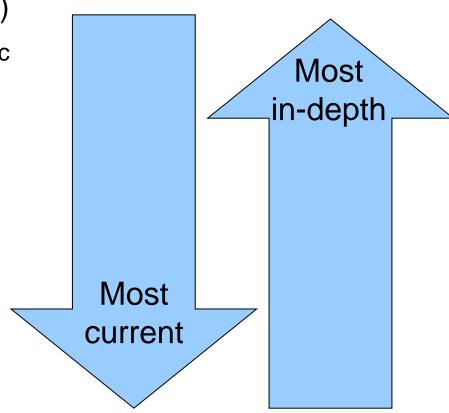
# Tertiary sources: Catalogs, Bibliographies, Bibliographic Databases

# Catalogs

- Material that is actually present in a given library
- Online materials where you have access through the library
- Contains monographs, sometimes also articles
- Bibliographies, Bibliographic Databases
  - Material that has been published in a given field or subfield
  - Contains monographs + articles
  - Only bibliographic metadata
    - Access to the full text must be found separately

# **Secondary sources: Types**

- Monographs (e.g. 300 pages long)
  - Monographs = Books on a single topic (no textbooks, no handbooks)
  - "Normal books"
  - Dissertations
  - Collections
- Articles (e.g. 12 pages long)
  - Journal articles
  - Articles in conference proceedings or collections



- Research Reports
  - Working papers, technical report

## **Journals**

## Characteristics

- Reliability
- Peer review process
- Publisher reputation
- Editor reputation

# Today

- ~X0.000 active, peer-reviewed journals
- Multi-billion business

## Submission

- Open to anyone
- Complete text, usually online as PDF

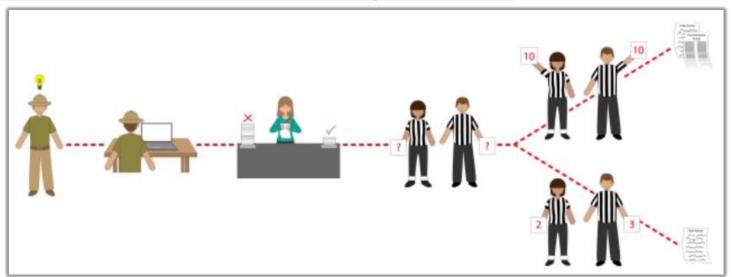
#### Peer Review

- Peers: Established scientists from the same field of study
- Reviewers grade and add remarks

## **Publication Processes**

Peer Review Process in 3 Minutes (Video)

http://www.lib.ncsu.edu/tutorials/peerreview





2014

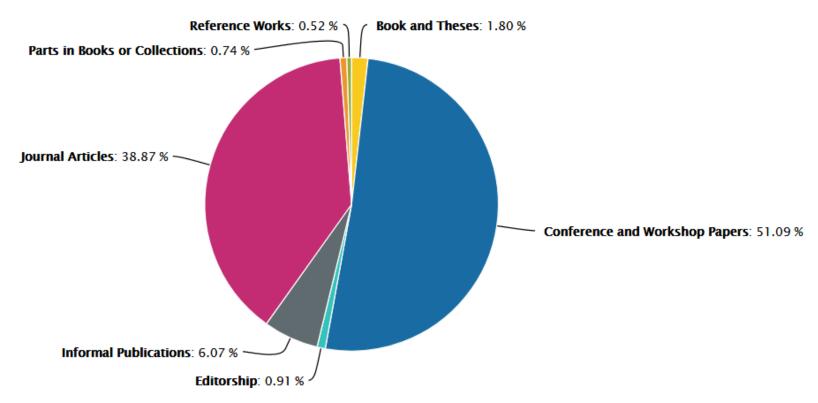
Anne Burke, Andreas Orphanides, Hyun-Duck Chung, Daria Dorafshar, Kyle Langdon, Kim Duckett (NCSU Libraries)

Open vs blind peer review

# Typical sources in computer science

- paper in a conference proceeding
- article in a journal

Distribution of publication type



DBLP, Statistics - Distribution of publication type

http://dblp.uni-trier.de/statistics/distributionofpublicationtype.html (last accessed 2020-07-20)

Bibliography contained currently ca. 5,18 Mio entries.

# **Remembering sources**

- Bibliographic data elements
  - Author(s)
  - Title, including subtitle
  - Publisher
  - Place published
  - Date published
  - ....
- Access information
  - Call number, location
  - URL
- Other information
  - Abstract
  - Review
  - Groups, Tags

Citation, list of references

Goal: uniquely identify the source

# Remembering sources

#### Books

- author, title, publisher, year
- address (city), edition
- Journal article
  - author, title, journal, year
  - volume, number, pages
- Article in a collection or proceeding = inproceeding or incollection
  - author, title, booktitle, year
  - pages
  - publisher/organization
  - editor

Knuth, D. E., *The TeXbook*. Addison-Wesley, 1986.

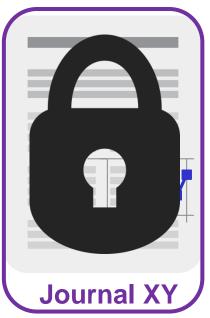
Knuth, D. E. and Plass, M. F., Breaking Paragraphs into Lines Softw., Pract. Exper., vol. 11, no. 11, pp. 1119-1184, 1981.

Knuth, D. E.; Motwani, R., and Pittel, B., Stable Husbands, in *Proceedings of the First Annual ACM-SIAM Symposium on Discrete Algorithms*, 22-24 January 1990, San Francisco, California, SIAM, 1990, pp. 397-404.

Open Science, Open Access (excursus)

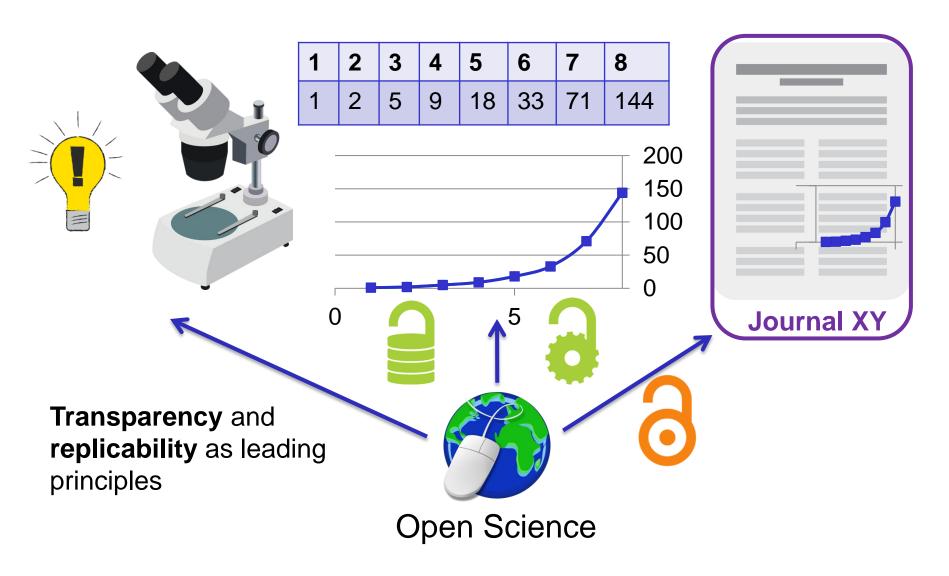
# **Visibility of research results (traditional)**



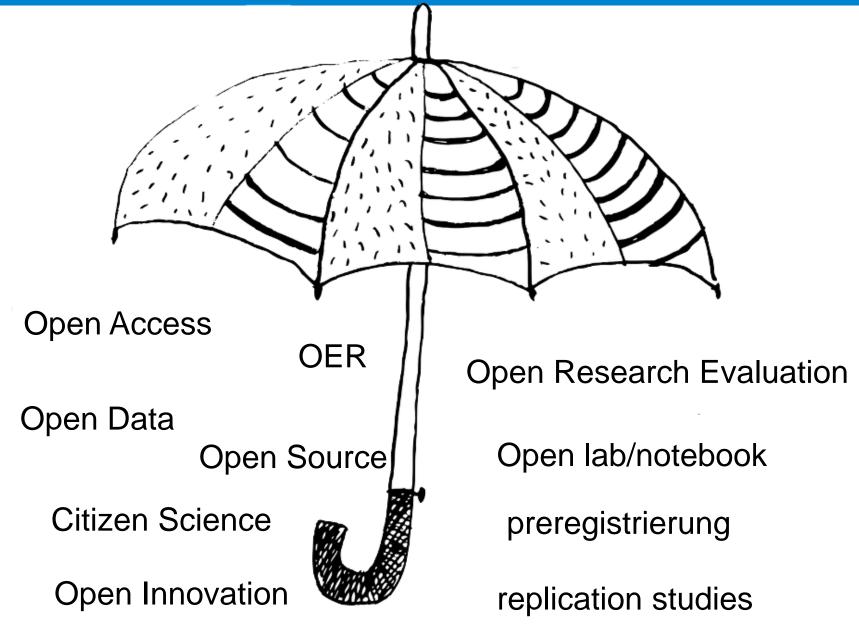




# Visibility of research results with Open Science



# Open Science as an umbrella term



## **Open Access**

- Open Access publications are freely available
- Open Access publications can be freely reused (read, download, copy, print, redistribute, data mine, ...)



- Peer review is independent of Open Access
- BUT also Open Access publications needs attribution (citations, references) when used in other works!
- There are several ways to achieve open access:
  - on publisher's sides vs. archive a copy in a repository (maybe in a different version and with an embargo)
  - with article processing charges vs. free to the author as well (e.g. on community-supported infrastructure)

Reference Management Systems (= Literaturverwaltungssysteme)

# Remembering sources revisited

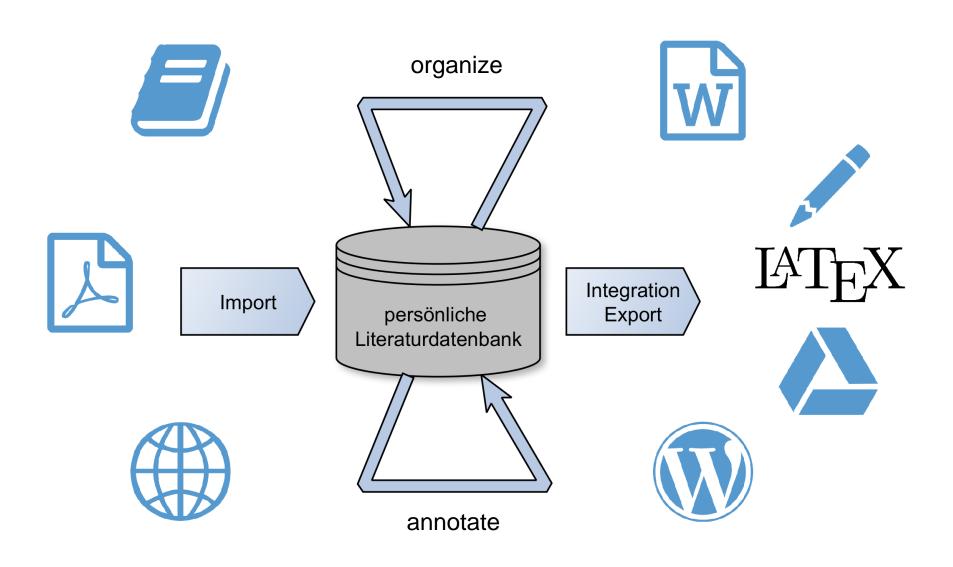
Taking notes on paper is tiring



Picture from: http://www.ib.hu-berlin.de/~kumlau/handreichungen/h82/Zettelkatalog.html

- Filing is difficult
- Searching is nearly impossible
- → reference management software

# Reference management software



# Advantages of reference management software

- Save/record/remember references with its details
- Organize references
  - Add tags
  - Use collections
- Save annotations linked to references
- Search references, possibly also their fulltext
- Create citations, bibliographies
- Support multiple citation styles and guidelines

# **Examples**

library support



- Citavi
  - "knowledge management"
  - Windows; commercial program, license from the library



- Zotero
  - "Save your references with one click"
  - Open Source, platform-independent



- Mendeley
  - "manage and annotate pdfs"
  - Free (2 GB PDF storage) and premium accounts
- JabRef
  - Java application, Open source
  - Good and easy interaction with LaTeX...





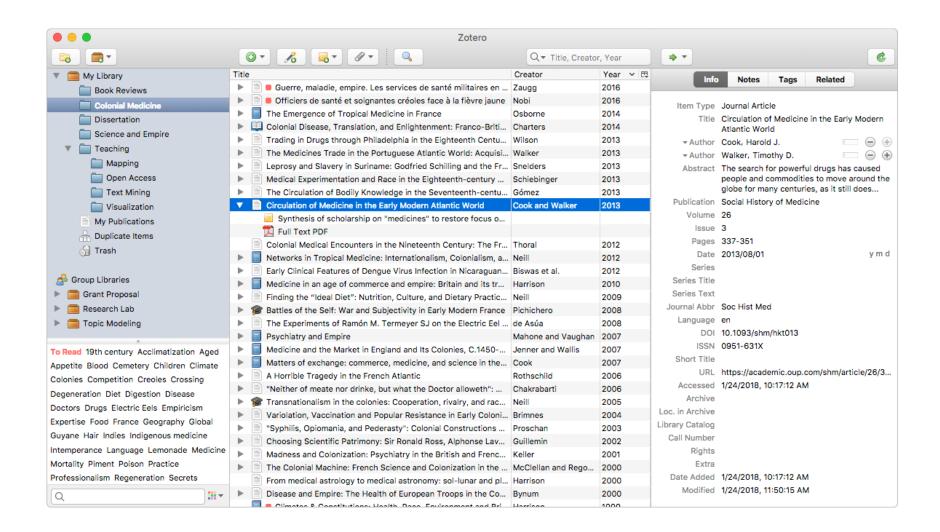
Zotero

#### **Zotero – Basic facts**

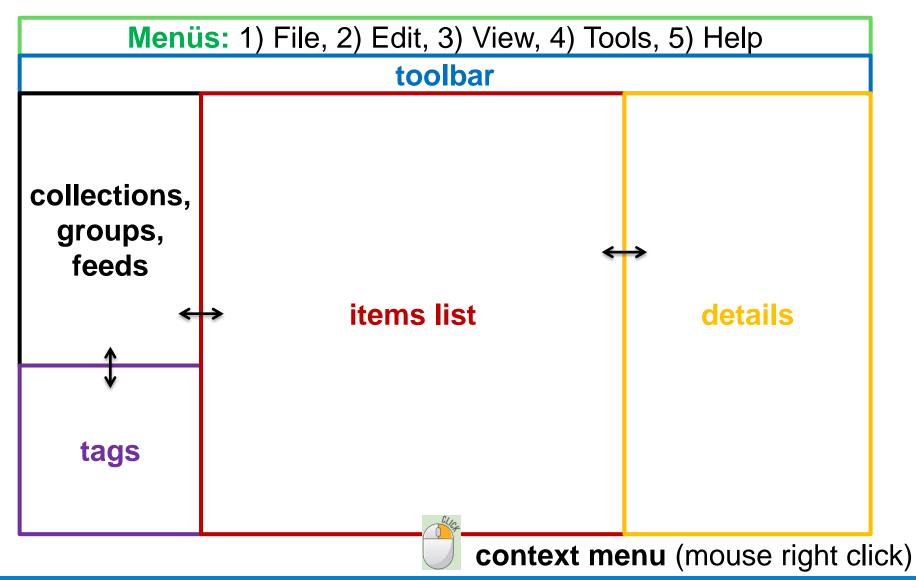
- Local client with possible online part, platform-independent
- Free and Open-Source Software (everything on GitHub)
- Strong user and developer community
- Project lead: George Mason University with its <u>Roy Rosenzweig</u>
   Center and the Corporation for Digital Scholarship (NPO)
- Open <u>forum</u> for support, questions and general discussion, read by the software developers and Zotero experts worldwide
- The <u>name "Zotero"</u> has its origin in the Albanian zotëro-j



#### **Zotero user interface**



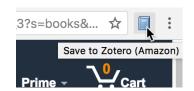
## **Zotero user interface - orientation**

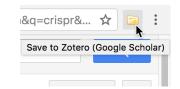


## Pick, save, import and create new entries

- Picker symbol in the browser toolbar
  - single entry
  - multiple entries
  - symbol (button) changes depending on the website you are currently
- Add entry by identifier
  - ISBN, DOI, PMID
- Import RIS, BibTeX files
- Extract Metadata from PDFs (drag & drop)
- Add entry manually
   or

Important: Check and improve metadata immediately!





# Bibliographic Metadata and identifiers

- Metadata formats
  - RIS
  - BibTeX
- DOI = Digital Object Identifier
  - E.g. 10.1109/ICCMC.2018.8487861
  - Resolve with <a href="https://doi.org/10.1109/ICCMC.2018.8487861">https://doi.org/10.1109/ICCMC.2018.8487861</a>
- ISBN = International Standard Book Number
- Other IDs for articles: PMID, PMCID, arXiv ID etc.

## Notes, attachments, searches

#### **Notes**

- Standalone notes, child notes
- First line is used as name
- Sorted alphabetically

#### Attach files

store a copy or link to a file

#### Search

- Quick search with different scopes
- Advanced search
- Save search as a dynamic collection





# Organize your database

#### **Collections**

- add item to one or several collections by drag and drop them
- delete item(s) from collection
  - item is still in your library but not in this collection anymore
  - If you want instead to delete an item completely, you can move it to the trash and then empty the trash.

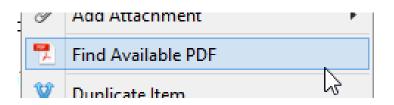
# **Tags**

- manual or automatic
- Filter on tags
- Assign a color



# **How to find a PDF from Zotero Entry**

 DOI, URL => Find available PDF (context menu on an entry)

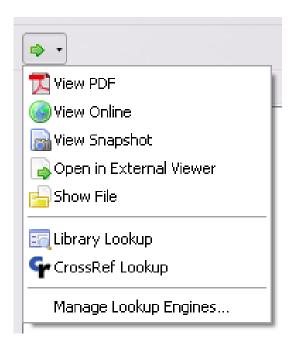


- DOI => CrossRef Lookup
- [\*] => Library Lookup

[\*] **Tip:** Add SFX-Server of UB Mannheim:

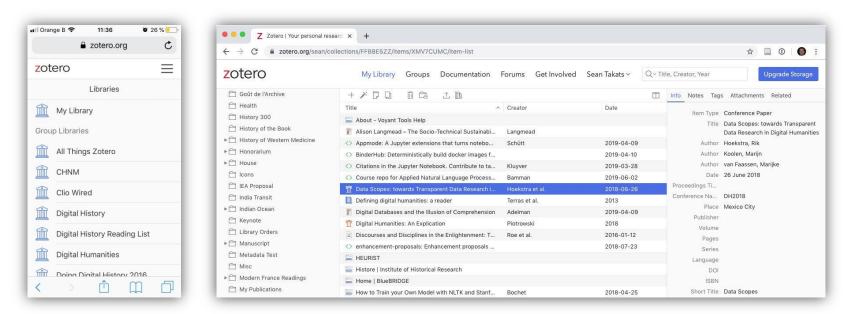
Preferences -> Advanced Tab -> OpenURL Resolver:

http://primo-49man.hosted.exlibrisgroup.com/openurl/ MAN/MAN\_UB\_service\_page



#### **Online features**

- free <u>online account</u> (optional)
- online synchronization among several devices
- working collaboratively in groups
- Online access and editing options with a browser:



View: New Web Library Beta

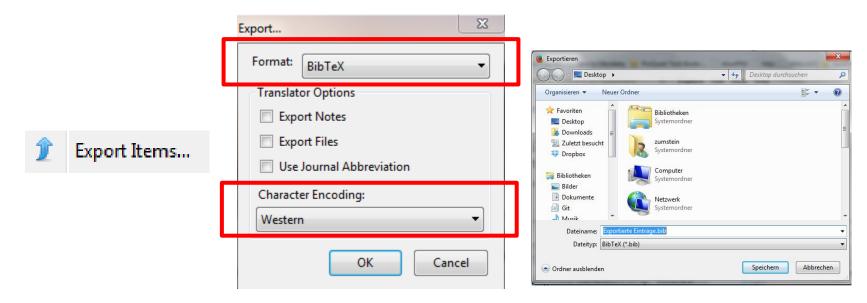
## **Synchronization**

- Synchronizing data
  - Items, tags, links, notes
  - Unlimited space for that
- Synchronizing attachments
  - PDFs, images, snapshots
  - 300 MB online space for attachments (more space for some money)
- Cloud storage which supports WebDAV as alternative
- Synchronizing data and attachments is configurable

More information: <a href="http://www.zotero.org/support/sync">http://www.zotero.org/support/sync</a> + <a href="http://www.zotero.org/support/sync">ZotFile</a>

## **BibTeX Export**

Select entries, context menu → Export Items... → BibTeX



- Character encoding, e.g. Western (check whether accents are replaced correctly, e.g. {\"o} for ö)
   (maybe activate Zotero Preferences → Export → char. encoding)
- Save the bib file in the correct directory, choose name

Search strategies

# **Finding access: Sources**

- Usually tertiary sources
  - Overview
  - Simplified
  - Often include references for further reading
- Start: Encyclopedia articles
  - Fundamentals
    - Concepts and definitions
    - Technical terms and abbreviations
  - Relation to the field or discipline
  - Contented issues
- And yes, Wikipedia can be a starting point
  - ... but it should not be your only one!
- Further: Handbooks or textbooks

Wikipedia Portals → See exercise in Ilias

### Finding access: Search strategy

- Online encyclopedias
  - Encyclopedia Britannica
  - Wikipedia
- Direct search in the local library catalog
  - Search terms
    - Your topic plus
    - handbook\*
    - encyclop\*
    - introduc\*
    - einführ\*
    - lehrbuch
- Take notes
  - Preferred terms used to describe your topic
  - Variants used to describe your topic

You'll need them!

## Learning about a research topic: Sources

- Usually secondary sources
  - Articles
  - Reports
  - Working papers
- Starting points
  - Bibliographic databases
    - Based on broad topic, discipline or field of study
    - Follow journals, serial publications and conferences
    - Contain mainly metadata records
    - Often also contain abstracts of articles
  - Full-text online archives
    - Based on broad topic, discipline or field of study
    - Limited to material from certain publishers
    - Contain metadata, abstract and full text

## Learning about a research topic: Search

- Basic strategy
  - For each applicable database/archive
    - Goal: Finding sources as close to your research question as possible
    - Search terms: Your topic term (and its variants) plus
      - Scope limitations
      - Practical applications
      - Data sets
    - Results:
      - None: if possible relax search by removing terms
      - Some: put in reference management software
      - Too many: specify search further by adding terms

### **Strategy 1: Focus on the conversation**

- Pre-condition
  - Small set of articles/books from the basic search
- Follow the references
  - Search for the sources referenced in the starting set
    - Add all to your reference manager
    - Skim the articles/abstracts and tag accordingly
  - Repeat once for the sources referenced in the extended set
  - → older source
- Do it the other way around
  - Search for sources referencing items in your starting set (Not all databases offer this kind of search)
    - Add all to your reference manager
    - Skim the articles/abstract and tag accordingly
  - Repeat for all sources tagged positive in your extended set
  - → newer sources

### Strategy 2: Focus on annotations

- Pre-condition
  - Small set of articles/books from the basic search
  - Knowledge of basic concepts and terms
- Locate annotations of the sources in your set
  - Index terms
  - Classification entries
  - Notations
- Search for sources with similar annotations
  - Refocus large result sets by adding a single term
    - From the topic OR
    - From scope limitations OR
    - From practical applications
  - Note, skim and tag
  - → Finds partial matches with your original research question(s)
  - → Finds new conversations to follow

### Practical considerations: Sample databases / archives

- Computer science
  - ACM Digital Library
  - IEEE Xplore
  - SpringerLink / LNCS
  - dblp









- Business administration
  - Business Source Premier
  - ABI/Inform
- Social Sciences
  - Web of Science

## **Practical considerations**









name	Association for Computing Machinery	Institute of Electrical and Electronics Engineers	Springer Nature (publisher)	Digital Bibliography & Library Project
scope	materials published by this publisher			bibliography for computer science
full text	Yes, they provide the full text of their content and index it also in the search			no, but links to publisher's side and OA versions
restricted	Yes, make sure you are on the university's network or connected by VPN			no

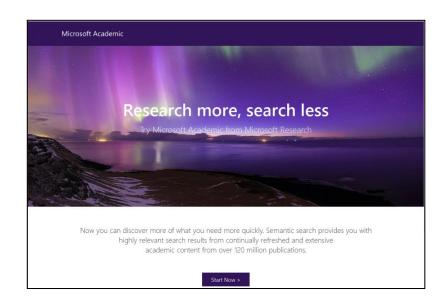
### **Obtaining the full-text of articles**

- Search using library services
  - Search for the journal name in ZDB, EZB or catalog
  - Locate the printed issues or the URL for the online version
- Search academic search engines, e.g.

https://scholar.google.de/



https://academic.microsoft.com/

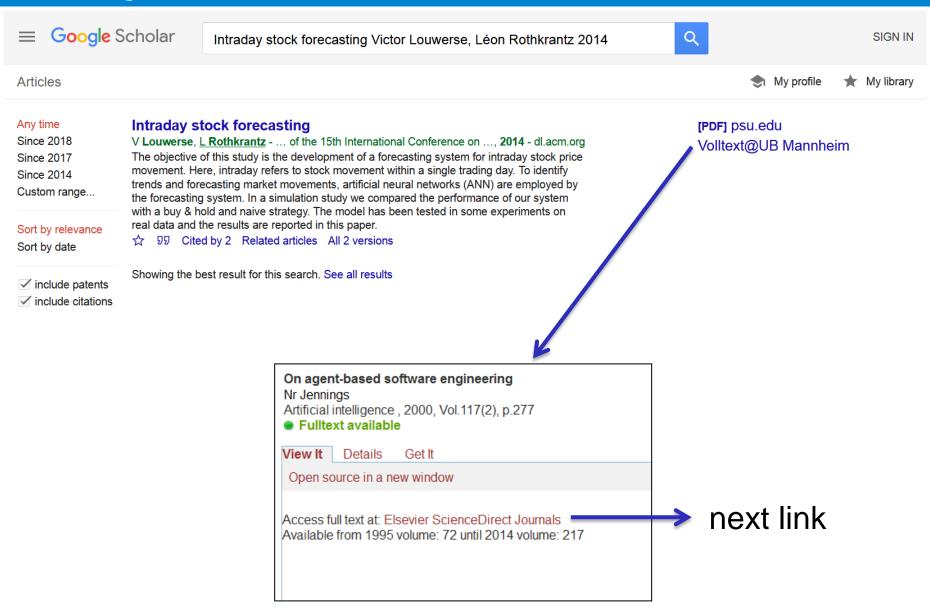


Others to try out:





### **Obtaining the full-text of articles**



Citing sources

### **Basics**

- Every piece of information must be attributed
  - Your own results
    - Experimental setup
    - Data sets
  - External sources
    - Findings
    - Experimental results
    - Conclusions
- Failing to document your own results properly is sloppiness
  - ... and can be easily avoided
- Failing to attribute information from external sources is plagiarism
  - ... and will get you expelled

## Citations vs. Plagiarism



# Copy



### **Paste**

### with attribution

Tiessen, Jan (2007): Die Resultate im Blick? ner/Döhler, Marian (Hrsg.): Agencies in W Tondorf, Karin/Bahnmüller, Reinhard/Klages, instrument. Anwendungspraxis, Probleme sigma.

Touraine, Alain (1984): Le retour de l'acteur: e Treiber, Hubert (1984): Warum man nicht die Mikroskop den ganzen Elefanten zu sehen.

= citations, references

## without attribution



= plagiarism

#### **Quotes**

#### In-line

- Introduce the quotation with a signal phrase
- Start and end the quoted text with quotation marks
- Naming conventions differ between disciplines and styles
- Example (APA style):

```
According to Jones (1998), "Students often had difficulty using APA style, especially when it was their first time" (p. 199).
```

Jones (1998) found "Students often had difficulty using APA style" (p. 199); what implications does this have for teachers?

#### Quotes

### Longer quotes

- Use text formatting to indicate a large block quote
- Quotation marks might be optional in this case
- Styling conventions differ according to style
- Example (APA style):

```
Jones's (1998) study found the following:
Students often had difficulty using APA style,
especially when it was their first time citing sources.
This difficulty could be attributed to the fact that many
students failed to purchase a style manual or to ask
their teacher for help. (p. 199)
```

### **Citation Rules**

### Leaving words out

According to Jones (1998), "This could be attributed to the fact that many students failed to [...] ask their teacher for help" (p. 199).

## Adding words

According to Jones (1998), "This difficulty [of using APA style] could be attributed to the fact that many students failed to purchase a style manual or to ask their teacher for help" (p. 199).

### **Citation Rules**

Changing characters

```
Jones (1998) found "[s]tudents often had difficulty using APA style" (p. 199); what implications does this have for teachers?
```

Indicating mistakes

```
Jones (1998) found "Studends [sic] often had difficulty using APA style" (p. 199); what implications does this have for teachers?
```

#### **Citations**

#### Summaries

- Paraphrasing information using your own words
- No quotation marks, as the words are your own
- Attribution to the source is still compulsory
  - Even if it is only an idea or something from a "further work" section!
- Attention: Simply re-phrasing or word juggling is not a summary, but an attempt at obfuscating the source, even if attributed. If in doubt, quote!
- Source naming convention is the same as with quotes
- Example (APA style):

Jones's (1998) study found that many students who had problems following the APA style guidelines did not ask their advisor for help.

### **Marginal notes**

- Limit quotes and summaries to relevant pieces of information
- Not strictly relevant additional information can be added using proper indicators, like cf. or see also
  - Additional interesting tidbits
  - URLs of software packages or companies
  - Side-tracking lines of thought
  - Additional sources that cover the topic in more depth or from a different angle
- Some disciplines use footnotes for marginalia, some for references
  - Computer science styles use proper references ©
  - Footnotes should be used sparingly. Nobody wants to read your anecdotes.
- Using marginalia to obfuscate the use of sources is plagiarism

### **Styles**

According to the handbook of van Leunen [REFERENCE], this paragraph should be longer than one sentence.

#### IEEE

According to the handbook of van Leunen [1], this paragraph should be longer than one sentence.

[1] Mary-Claire van Leunen, A Handbook for Scholars, Knopf, 1979

### Apalike

According to the handbook of van Leunen [van Leunen, 1979], this paragraph should be longer than one sentence.

[van Leunen, 1979] van Leunen, M.-C. (1979). A Handbook for Scholars. Knopf

### Alpha

According to the handbook of van Leunen [vL79], this should be longer than one sentence.

[vL79] Mary-Claire van Leunen. A Handbook for Scholars. Knopf, 1979