# 2 Literature review

## 2.2 Writing the literature review

DAT390

Institutt for datavitskap

Digitalisering på Ås

# Literature reviews as stand-alone journal articles

Papers that review the literature can be well-received contributions to science.
Let us look into two examples by our colleagues:

## van der Waals forces in density functional theory: The vdW-DF method

Kristian Berland,[1] Valentino R. Cooper,[2] Kyuho Lee,[3,4] Elsebeth
Schröder,[5] T. Thonhauser,[6] Per Hyldgaard,[5] and Bengt I. Lundqvist[7]

[1] Centre for Materials Science and Nanotechnology, SMN, University of Oslo, NO-0318 Oslo, Norway
[2] Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831-6114, USA.
[3] Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, California 94720, USA.
[4] Department of Chemical and Biomolecular Engineering, University of California, Berkeley, California 94720, USA.
[5] Microtechnology and Nanoscience, MC2, Chalmers University of Technology, SE-412 96 Göteborg, Sweden.
[6] Department of Physics, Wake Forest University, Winston-Salem, North Carolina 27109, USA.
[7] Department of Applied Physics, Chalmers University of Technology, SE-412 96 Göteborg, Sweden.
(Dated: December 23, 2014)

A density functional theory (DFT) that accounts for van der Waals (vdW) interactions in condensed matter, materials physics, chemistry, and biology is reviewed. The insights that led to the construction of the Rutgers-Chalmers van der Waals Density Functional (vdW-DF) are presented

Research Article

## A review on applications of activity recognition systems with regard to performance and evaluation

Suneth Ranasinghe, Fadi Al Machot and Heinrich C Mayr

**Abstract**
Activity recognition systems are a large field of research and development, currently with a focus on advanced machine learning algorithms, innovations in the field of hardware architecture, and on decreasing the costs of monitoring while increasing safety. This article concentrates on the applications of activity recognition systems and surveys their state of the art. We categorize such applications into active and assisted living systems for smart homes, healthcare monitoring applications, monitoring and surveillance systems for indoor and outdoor activities, and tele-immersion applications.
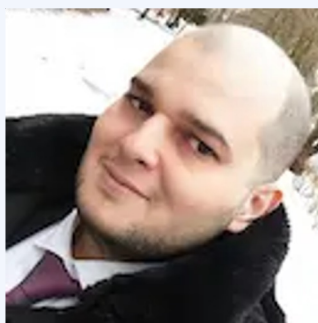
# General advice

**Don't let ChatGPT write your text.**
–Remember that this exercise is not graded. It is to help you learn this.
–You do not **improve your academic writing** unless you **do it yourself**.
–ChatGPT also often makes up false information and literature sources.
–**Instead, do** read the academic literature carefully and replicate the style of successful authors from the field of application that you will work on.

**Don't cite "unacademic" literature.**
–Are you "allowed" to cite websites, newspapers, forums, standard textbooks read by students, *etc.*? Yes, it is "allowed."
But it looks unprofessional, and as a beginner you must learn how to look professional.
–**Instead, do** cite **journal articles** and **conference papers** only, for now.

**Don't steal other authors' diagrams and other figures.**
–Even if you cite the source (otherwise it's plagiarism), it may be illegal.
–**Instead, do** submit **documentation that you hold the license** for any figures that you are reusing, or avoid reusing others' figures altogether.

# General advice

Do all the below all the way until the final report.
- Best for your Master thesis as well.

**Don't cite "unacademic" literature.**

    **Do** cite **journal articles** and **conference papers** only, for now.

**Don't steal other authors' diagrams and other figures.**

    Submit **documentation that you hold the license** for any figures that you are reusing, or avoid reusing others' figures.

# What literature should be discussed?

For the "draft report" submission on 4th October, discuss at most 24 papers. This number is reached easily:

–What are the main literature sources for **methods** that you will be using? The same for methods that are popular, but that you will *not* use.

–The same as above for **knowledge** that you will build on, or *not* build on.

–Your **main advisor** should *e.g.* recommend **three key references**. If the advisor cannot competently do this, it is a wrong combination of person and topic. In this case urgently change your topic, or advisor, or both.

–Yes, do a literature research, but don't get lost at this stage. Focus on **selecting key papers** that you can actually read, analyse, and report on.
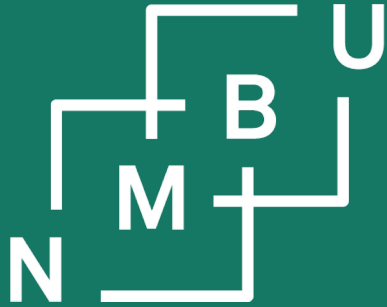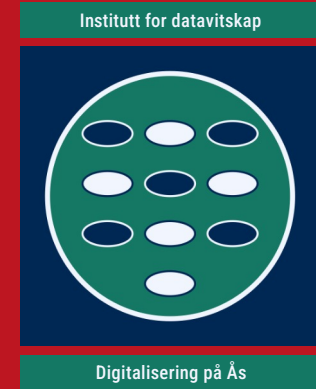
# 2 Literature review

DAT390

# Structure of the full report

**Title**

- Must be concrete and understandable

**Summary/Abstract**

- Goals of the study
- Short description of the background
- Short description of the results

**Introduction**

- Motivation for the study
- «Set the scene for the reader»
- Background for the study
- From relatively broad to specific, not the other way around
- What is new in this project?
- Site relevant literature

**Theory and background**

- What background knowledge does the reader need in order to understand the problem and the methods you are using?
- Description of necessary theory with references to literature

Literature review

# Structure of the full report

**Methods**
- Should describe which methods you used, which settings/parameters you applied and give references to relevant softwares
- The theory behind the methods should be in «Theory and Background»
- It is important that the reader can reproduce your results based on what you write

**Results**
- The findings must be documented with references or arguments
- Figures and tables

**Discussion (can be combined with results)**
- What is your interpretation of the findings and why?
- What do you recommend?
- Use references - put your findings in context

**Conclusion**
- Should be short

**References**
- The reader should be able to find the literature based on your references

# What characterises a "good" title?

Many will read the title, but only a few will read the entire paper

    -> Choose the words in the title with care

Length of the title: Too short a title gives too little information, but too long titles are  sometimes even less meaningful

NB!! A title is neither an abstract nor a sentence

Goals:
- The contents of the paper described using few words
- Avoid unneccessary phrases like "Studies on", or "Investigations on"
- Be specific rather than general
- Mind your word order and syntax
- Avoid abbreviations and jargon

https://guides.lib.uci.edu/c.php?g=334338&p=2249904

# "Title checklist"

Does it reflect the aim and approach of the work?

Is it clear and informative?

Does the title give a full yet concise and specific indication of the work reported?

Avoid:

- Overly clever or punny titles that will not fare well with search engines or international audiences
- Titles that mention results or conclusions
- Titles that are too short to be descriptive or too long to be read
- Jargon, acronyms and trademarked terms

From: https://guides.lib.uci.edu/c.php?g=334338&p=2249904 and How to Write a Good Scientific Paper. Chris A. Mack. SPIE. 2018.

# Summary/Abstract

Communicates **compressed information** and includes the **purpose, methods and scope**

Usually **short (250 words or less)** and allows the readers to decide whether they want to read the article

A "good" abstract
- has introduction/body/conclusion structure,
- presents purpose, results, conclusions and recommendations in that order,
- adds no new information, and
- is understandable to a wide audience

Should communicate:
- What was done?
- Why was it done?
- How was it done?
- What was found?
- What is the significance of the findings?

https://guides.lib.uci.edu/c.php?g=334338&p=2249904

# Introduction

Describes briefly and clearly **why you are writing the paper**

Supplies **sufficient background information** for the reader to understand and evaluate the work done

Supplies a rationale for the study

Goals:
- Present the problem and the proposed solution
- Present the nature and scope of the problem
- Review relevant literature
- State the methods used and the main results

https://guides.lib.uci.edu/c.php?g=334338&p=2249904

# "Introduction checklist"

Does it describe the field of the work, why it is important, and what has already been done?

Is the purpose outlined and the research described (clearly indicating what is novel and why it is significant)?

Is a gap identified, a research question asked, or prior work challenged?

Avoid:

- Repeating the abstract
- Providing unnecessary background information
- Exaggerating the importance of the work
- Claiming novelty without a proper literature search

From: https://guides.lib.uci.edu/c.php?g=334338&p=2249904 and How to Write a Good Scientific Paper. Chris A. Mack. SPIE. 2018.

# Figures

- The figure text should be sufficient so that the reader understands the figure without reading the text itself

- If it is not your own figure, the reference must be provided

- Symbols, axses etc. that are used in the figure must be defined

- You must refer to the figures and give a description of what they show in the main text

# Example

## 2.3.3 Varying cross section with neutron energy

The probability of an interaction between a neutron and a nucleus is very dependent on the energy of the incoming neutron. In general, a slow moving neutron has a much higher probability of interacting with a nucleus than a fast moving neutron [27]. This is illustrated in the upper half of Figure 2-4 where the isotope usually used in nuclear reactors, $^{235}_{92}U$, has a significant higher fission cross section at low neutron energies than high energies. The lower half of Figure 2-4 illustrates the fissile nature of $^{238}_{92}U$ which only fissions at high neutron energies over 1 MeV (i.e. by fast neutrons).
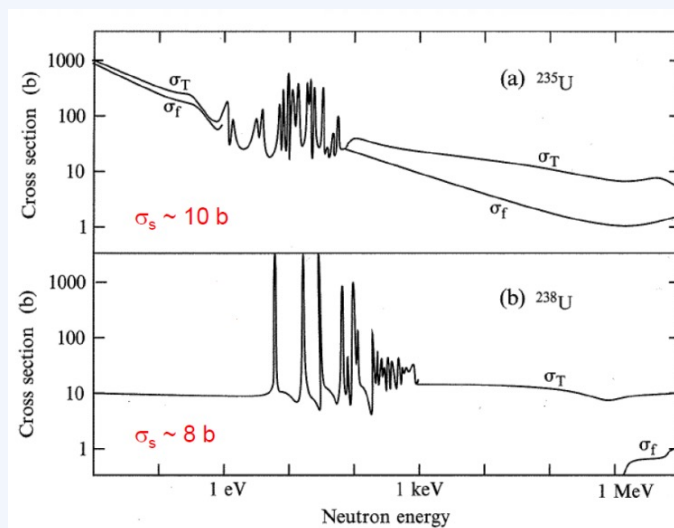


Figure 2-4. Varying cross sections for $\sigma_f$ in $^{235}_{92}U$ (a) and $^{238}_{92}U$ (b) at different neutron energies [28].

T. Willig, MSc oppgave 2011

# Tables

**Table 2:** Content of Ti and B in Al-Si alloy before and after equilibration. $K_{sp}$-values in the last column. From [1].

| Sample | Temperature, $T$ (K) | Initial Content, ppma | | After Equilibration, ppma | | $X_{\text{Ti in Si-Al melt}} X_{\text{B in Si-Al melt}}^2$ |
|---|---|---|---|---|---|---|
| | | Ti | B | Ti | B | |
| S-01 | 1273 | 115 | 310 | 44 | 170 | $1.28 \times 10^{-12}$ |
| S-02 | 1273 | 242 | 480 | 80 | 176 | $2.49 \times 10^{-12}$ |
| S-03 | 1273 | — | — | 92 | 162 | $2.40 \times 10^{-12}$ |
| S-04 | 1273 | — | — | 142 | 136 | $2.63 \times 10^{-12}$ |
| S-05 | 1273 | 753 | 310 | 211 | 96 | $1.96 \times 10^{-12}$ |
| S-06 | 1273 | 424 | 480 | 245 | 104 | $2.64 \times 10^{-12}$ |
| S-07 | 1273 | 1306 | 502 | 366 | 94 | $3.26 \times 10^{-12}$ |
| S-08 | 1273 | 1160 | 310 | 538 | 59 | $1.87 \times 10^{-12}$ |
| S-09 | 1273 | 903 | 480 | 617 | 63 | $2.45 \times 10^{-12}$ |
| S-10 | 1273 | 2420 | 310 | 1603 | 41 | $2.65 \times 10^{-12}$ |
| S-11 | 1273 | 2230 | 221 | 1666 | 30 | $1.51 \times 10^{-12}$ |
| S-12 | 1273 | 2756 | 221 | 2498 | 36 | $3.32 \times 10^{-12}$ |
| S-13 | 1173 | 215 | 280 | 80 | 27 | $5.95 \times 10^{-14}$ |
| S-14 | 1173 | 170 | 188 | 92 | 34 | $1.08 \times 10^{-13}$ |
| S-15 | 1173 | 510 | 215 | 152 | 20 | $6.33 \times 10^{-14}$ |
| S-16 | 1173 | 282 | 280 | 157 | 21 | $7.17 \times 10^{-14}$ |
| S-17 | 1173 | — | — | 179 | 28 | $1.42 \times 10^{-13}$ |
| S-18 | 1173 | 355 | 280 | 229 | 25 | $1.40 \times 10^{-13}$ |
| S-19 | 1173 | 649 | 243 | 387 | 14 | $8.40 \times 10^{-14}$ |
| S-20 | 1173 | 649 | 243 | 427 | 18 | $1.38 \times 10^{-13}$ |
| S-21 | 1173 | 730 | 280 | 559 | 11 | $6.36 \times 10^{-14}$ |
| S-22 | 1173 | 906 | 280 | 721 | 12 | $9.68 \times 10^{-14}$ |
| S-23 | 1173 | 1368 | 243 | 855 | 11 | $1.05 \times 10^{-13}$ |
| S-24 | 1173 | 1105 | 280 | 978 | 10 | $1.04 \times 10^{-13}$ |

Must be referred to in the main text

# Documentation and references

All claims must be documented with

- Reference

- Own argument

All literature you refer to should be noted in the reference list

It must be possible for the reader to find this article / book from the information you have provided

You must have seen the article before putting it in the reference list to make sure that what you believe should be in there really is there
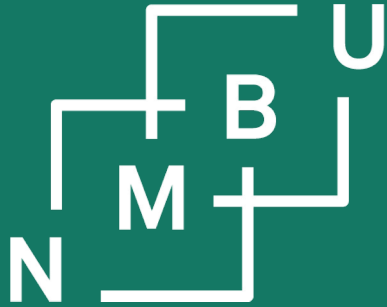
See https://www.nmbu.no/om/biblioteket/skrive/referansestiler for examples and help

# The writing center and other resources
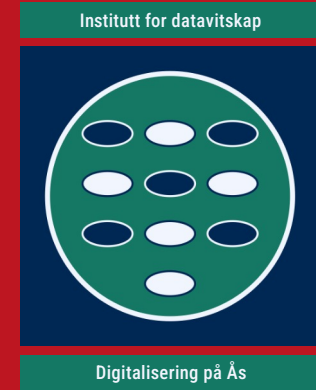
https://www.nmbu.no/en/students/writing-centre

https://www.nmbu.no/en/students/degree-thesis-nmbu

# 2 Literature review

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# References - variants

## References

[1]  Coohill T.P., Peak M.J., Peak J.G. 1987. Yearly review. The effects of ultraviolet wavelengths of radiation present in sunlight on human cell *in vitro*. Photochemistry and Photobiology 46, 1043-1050.

This is an article in a scientific journal. The correct way to refer to such articles is as follows (order):
Authors. Year. Title. Journal name, volume number, page numbers.

[2]  Smith M. 1999. Dept. of physics, University of XX, USA, personal communication.

You have talked to or otherwise been in contact with Smith.

[3]  Steveninck J. van, Dubbelmann T. 1983. Photodynamic membrane damage. In: Porphyrin Photosensitization. Edited by: D. Kessell., Plenum, New York, pp. 227-240.

This is an article in a book by several authors. Order: Authors of the article. Year. Title of the article. In: Title of the book the article is in. Edited by: Names of the editors. Publisher, place of publication, page numbers.

[4]  Murray, J.D. 1993. Mathematical Biology, second edition. Springer-Verlag, Berlin.

This is a book. Order: Authors. Year. Title, Edition. Publisher, Place of publication.

**NB! Not alphabetically, but in the order in which you use the references in your report. This is often used within chemistry, physics and mathematics.**

# References - variants

## References

Coohill T.P., Peak M.J., Peak, J.G. 1987. Yearly review. The effects of ultraviolet wavelengths of radiation present in sunlight on human cell *in vitro*. Photochemistry and Photobiology 46: 1043-1050.

Murray, J.D. 1993. Mathematical Biology, second edition. Springer-Verlag, Berlin.

Smith, M. 1999. Dept. of physics, University of XX, USA, personlig kommunikasjon.

Steveninck J., Dubbelmann T. 1983. Photodynamic membrane damage. In: Porphyrin Photosensitization. Edited by: D. Kessell., Plenum, New York, pp. 227-240.

**NB! Alphabetically, not numbered. That is, the reference in the text becomes (Coohill et al. 1987) for more than two authors, (Steveninck and Dubbelmann 1983) for two authors and (Murray 1993) for one author. This is often used within biology and biophysics.**

# Web-references

You must include the full URL and date when you last accessed the page.

If other information is provided, this should also be included.

- E.g. authors, DOI, dates

**The following examples are taken from https://www.ntnu.no/viko/vancouver-eksempler**

## Website with author

**Strukture/template**
Surname Initial(s). Title [Internet]. Location: Publisher; Publication date [updated date; retrieved date]. Available from: http: // ...

**In the reference list**
Kapperud G. Utbruddsveilederen [Internet]. Oslo: Folkehelseinstituttet; 2016 [retrieved June 30, 2016]. Available from: https://www.fhi.no/nettpub/utbruddsveilederen/

**In the text**
(14)

# Website with an organization as author

**The following examples are taken from** https://www.ntnu.no/viko/vancouver-eksempler

### Strukture/template
Organization or Institution. Title [Internet]. Location: Publisher; Publication date [updated date; retrieved date]. Available from: http: // ...

### In the reference list
Mattilsynet. Lokalmat [Internet]. Brumunddal: Mattilsynet; March 3, 2015 [updated June 14, 2017; retrieved June 30, 2017]. Available from: https://www.mattilsynet.no/mat_og_vann/produksjon_av_mat/Lokalmat/

### In the text
(15)

# Website without author

**The following examples are taken from** [https://www.ntnu.no/viko/vancouver-eksempler](https://www.ntnu.no/viko/vancouver-eksempler)

### Strukture/template
Title [Internet]. Location: Publisher; Publication date [updated date; retrieved date]. Available from: http: // ...

### In the reference list
eatright.org [Internet]. Chicago: Academy of Nutrition and Dietetics; c2017 [retrieved May 27, 2017]. Available from: http://www.eatright.org/

### In the text
(16)

# References

What variants you use is up to you

You must refer to the original source

References must be cited in figure texts to document where you have taken
the figure from

# Example

Ei DCE-MRI-undersøking startar med ein injeksjon av kontrastmiddel, *[4]*. Dette vert frakta med blodet til den delen av kroppen som skal undersøkjast. Formålet med kontrastmidlet er å endre $T_1$- og/eller $T_2$-relaksasjonstida ved spinninteraksjon mellom elektron i kontrastmidlet og proton i vevet, *[23]*. Dette vil auke kontrasten mellom vev som tek opp mykje kontrastmiddel og vev som tek opp lite. Ettersom kreftvev har dårlegare karnettverk enn friskt vev, sjå meir i *kap 2.3*, vil svulsten skilje seg ut på bileta. Eit døme på MR-bilete med og utan kontrastmiddel er vist i *figur 9*. Her ser ein at kontrastmidlet får svulsten til å tre tydeleg fram.
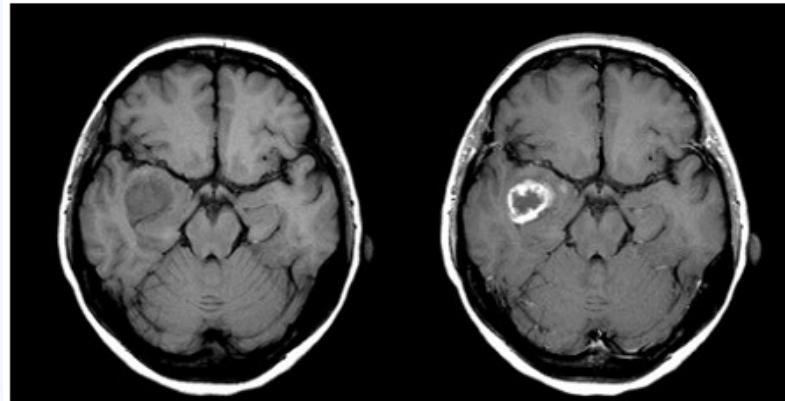


*Figur 9: MR-bilete av ein pasient med hjernesvulst. Biletet til venstre er teke utan kontrastmiddel, medan biletet til høgre er teke etter injeksjon av kontrastmiddel. Kontrastmiddlet fører til at svulsten kjem tydelegare fram. Henta frå Bjørnerud, [23].*

T.Torheim, MSc oppgave 2011

# Example

Dexter (1987) developed a simplified theoretical model for the compression of soil around an advancing root by assuming that the volume of the growing root is accommodated by a decrease of porosity in the surrounding soil. Previous studies of metal probes, a pea root and an expanding tube in soil suggested that soil density might decrease exponentially from a root's surface (Dexter & Tanner, 1972; Greacen *et al*., 1968). Thus, Dexter approximated porosity, $\eta$, defined as the pore volume fraction of a volume of soil, by an exponential model where $\eta(r)$ is directly proportional to $(1-e^{-kr/r_0})$, where $r$ is the distance from the root surface, $r_0$ is the root radius and $k$ is a dimensionless constant reflecting soil mechanical properties.

Vollsnes et al. 2010

# What bibliographic data are given in usual practice?

You should have a paper in front of you right now.

Take five minutes to do the following:
—**Look into the reference list** for that paper. Among the references, identify a journal article and a conference paper.
—**What bibliographic data are given for a journal article?** Write a list.
—**What bibliographic data are given for a conference paper?** Write a list.

Journal article:
—Author names (first name: initials)
—Paper title (?)
—Journal title (is it abbrevated?)
—…
—…

Conference paper:
—Author names (first name: initials)
—Paper title (?)
—Conference name? Or is it the proceedings book title?
—…
—…

# What bibliographic data are given in usual practice?

You should have a paper in front of you right now.

Now we will try and reproduce such a typical literature entry using BibTeX:

–Create a BibTeX entry for a journal article.
–Create a BibTeX entry for a conference paper.
–Cite them in a LaTeX file and compile it using LaTeX and BibTeX.

Journal article:
–Author names (first name: initials)
–Paper title (?)
–Journal title (is it abbrevated?)
–…
–…

Conference paper:
–Author names (first name: initials)
–Paper title (?)
–Conference name? Or is it the proceedings book title?
–…
–…

# Providing digital object identifiers (DOI)

DOIs are persistent identifiers (PIDs), and it is considered good practice to use them – specially for a work submitted as a student in data science.

The canonical way in BibTeX would be through the "doi" entry:

```
@article{…
   doi = {10.1007/s11705-021-2046-x}
}
```

**Problem:** Some BibTeX styles ignore the "doi" entry!

**Alternatives** (only use them if the "doi" entry does not work):

url = {https://dx.doi.org/10.1007/s11705-021-2046-x}

or

note = {doi:10.1007/s11705-021-2046-x}

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```
@article{…
   doi = {10.1007/s11705-021-2046-x}
}
```

**Remarks:**

– For your literature list, it is most important that the style is **consistently always the same**: Either use DOIs wherever possible, or don't use them.

– Even if you give a DOI, **provide all the other key bibliographic data** as well.

    Exception: You are very limited in space, due to a hard page limit.

– When giving the DOI, **don't additionally give a URL**, and vice versa.

# Examples: How could these citations be improved?

Ramirez, C. A. M., Greenop, M., & Ashton, L. (2020). Applications of machine learning in spectroscopy. https://doi.org/10.1080/05704928.2020.1859525

Cited in text as: Ramirez mfl., 2020

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Ramirez, C. A. M., Greenop, M., & Ashton, L. (2020). Applications of machine learning in spectroscopy. https://doi.org/10.1080/05704928.2020.1859525

Cited in text as: Ramirez mfl., 2020

[IND(2018)]  Conceptual understanding of convolutional neural network-a deep learning approach. *Procedia Computer Science*, 132:679–688, 2018. ISSN 1877-0509. doi: https://doi.org/10.1016/j.procs.2018.05.069. URL https://www.sciencedirect.com/science/article/pii/S1877050918308019. International Conference on Computational Intelligence and Data Science.

Cited in text as: [IND(2018)]

# More technicalities

What information <u>not</u> to give in a literature list:
- The **ISSN** of a journal (as opposed to the ISBN of a book)
- The **publisher of a journal** (as opposed to the publisher of a book)
- The **month** in which a paper was published (as opposed to the year)

Styles and conventions depend on journals and the field of work, but from experience, the above are always seen as unusual (therefore, unprofessional).

Redundant or excessive information when referencing the work in the text:
- Use "et al." when there are many authors – don't list all the names (in the manuscript text; in the literature list, you *can* list all the names).
- Use numerical citations [1] or author-year citations (First *et al.*, 2023), but not both at once – this looks like a mistake (First *et al.*, 2023) [1].

Always: Do provide enough information so that the paper can be found even without searching for the paper title.

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—The ISSN of a journal (as opposed to the ISBN of a book)
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# Examples: How could these citations be improved?

[Lin21]  Hongjie Lin. Construction of fuzzy ERP data analysis system based on deep learning. In *2021 Third International Conference on Intelligent Communication Technologies and Virtual Mobile Networks (ICICV)*. IEEE, February 2021.

Cited in text as: [Lin21]

# Examples: How could these citations be improved?

[Lin21]  Hongjie Lin. Construction of fuzzy ERP data analysis system based on deep learning. In *2021 Third International Conference on Intelligent Communication Technologies and Virtual Mobile Networks (ICICV)*.
IEEE, February 2021.

Cited in text as: [Lin21]

Zhu, X. (2005).  Semi-supervised learning literature survey.
https://minds.wisconsin.edu/handle/1793/60444.

Cited in text as: (Zhu, 2005)

# Focus on high-quality academic references

To appear professional, focus on citing:
—Journal articles
—Conference papers
—Contributed chapters in edited volumes

You are allowed to cite any other sources, including technical reports.
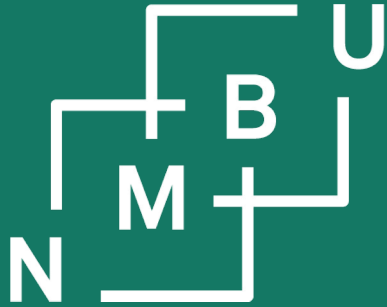But there should be a very good reason!

# When finalizing your literature review …

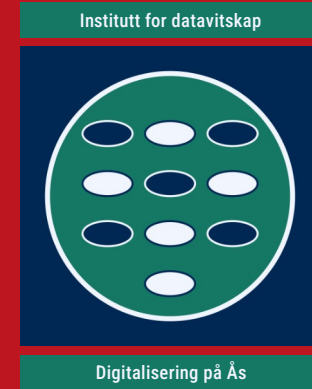This is the first step toward your DAT390 report, and toward your thesis.

You will receive feedback concentrating on three questions:

1) Are you covering the key aspects of the state of the art?
(Such as the methods and the results and knowledge from previous work)

2) Do you analyse the references from your own point of view?
(Instead of summarizing the references from *their* point of view)

3) Are the references to high-quality material, and are they cited correctly?
This looks like a technicality, but is very important in assessing your work.

To make the feedback most valuable, concentrate on these items as well.

# DAT390 Data science seminar

## 2   Literature review