

From loose idea to multiple publications

A case of how to improve the quality of a bachelor thesis
including the LIBRARY on the loop

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Process

- **Ideally 2 students and 2 supervisors per thesis**



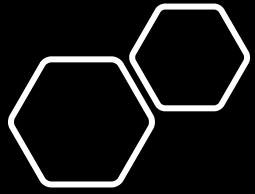
Process

- Ideally 2 students and 2 supervisors per thesis
- **Many iterations from vague thesis proposal to final project description**



Process

- Ideally 2 students and 2 supervisors per thesis
- Many iterations from vague thesis proposal to final project description
- **Regular meetings to provide feedback and monitor progress
(2 every month)**



Process

- Crush course on literature search



Scopus

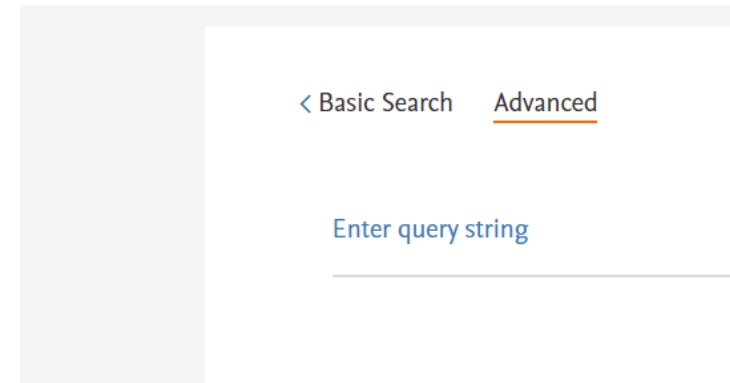
TOOLS



zotero

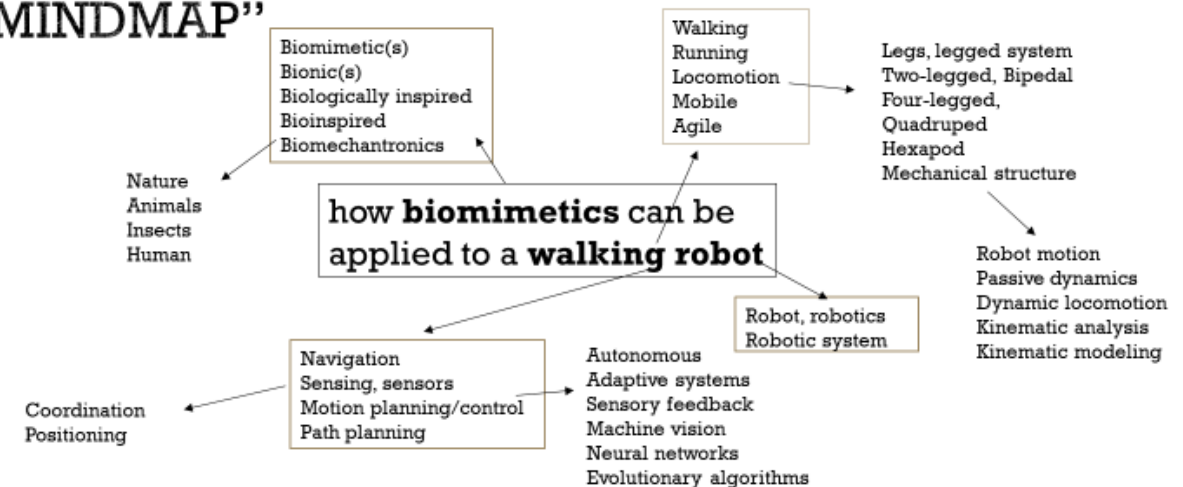


Advanced search



PREPARATION – SEEK & FIND – EVALUATE & DOCUMENT

“MINDMAP”

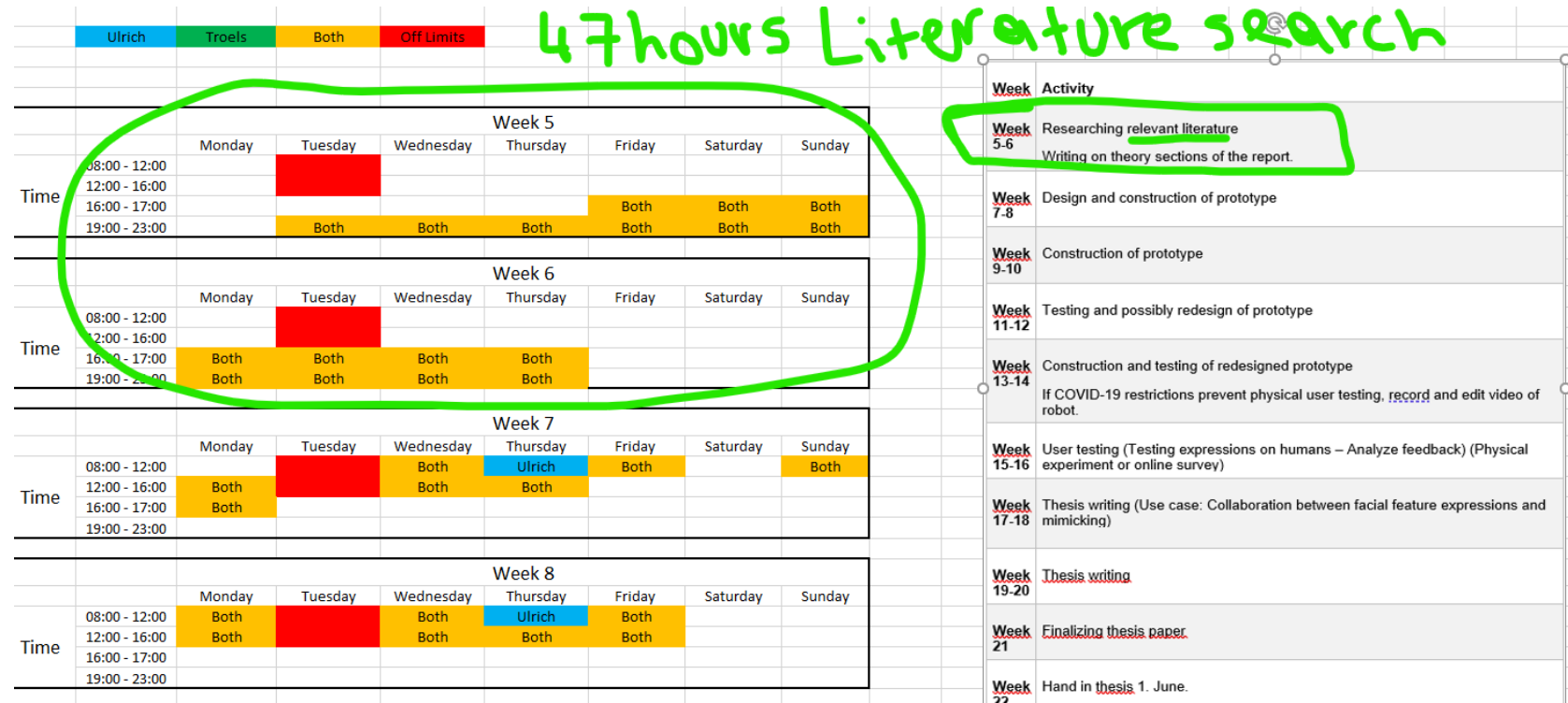


of a possible search string: (biomimetic* OR bioinspired OR bionic) AND (bipedal OR walking OR legged) AND robot*
on the results retrieved, you can try to add more terms to make it more specific or delete some terms to make it more general



Process

- Begin the project with 2.5 weeks of Literature Search (47h x 2)



Process

- Log searches

Logbook

Defining the literature and materials to be used in your paper

Criteria of inclusion:

- Geographic location limited to the Western world
- Looking into peer-reviewed primary scientific literature, review articles, book chapters/ journal articles/conference proceedings.

Criteria of exclusion:

- Study was published more than 10 years ago
- Study was published in a language other than English
- Editorials and letters to the editor

Search history - overview of the databases and search terms that have been used and of the different search results

Date	Database	Search strategy	Search terms (combination of search terms, use of phrase search, keyword search etc.)	Notes	Number of hits	Items selected
02.02.2021	Scopus	Building blocks search	("nonverbal communication" OR expression* OR "non-verbal communication") AND (robot* OR "soft robot" OR "soft robotics") AND (interaction* OR "social robot interaction" OR "human-robot interaction" OR "human robot interaction")	Too many results. Change block 1. (Removed expression*)	9.396	
02.02.2021	Scopus	Building blocks search	("nonverbal communication" OR "non-verbal communication") AND (robot* OR "soft robot" OR "soft robotics") AND (interaction* OR "social robot interaction" OR "human-robot interaction" OR "human robot interaction")		1.265	

			"human robot interaction")			

You can add this overview to your paper as an appendix

Motivation for your choice of documents (your notes for the methods and materials section of your paper)

Search 1:

("nonverbal communication" OR expression* OR "non-verbal communication") AND (robot* OR "soft robot" OR "soft robotics") AND (interaction* OR "social robot interaction" OR "human-robot interaction" OR "human robot interaction") AND (LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-TO (PUBYEAR, 2010)) AND (LIMIT-TO (SUBJAREA, "COMP") OR LIMIT-TO (SUBJAREA, "ENGI") OR LIMIT-TO (SUBJAREA, "NEUR") OR LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "PSYC")) AND (LIMIT-TO (DOCTYPE, "ac") OR LIMIT-TO (DOCTYPE, "cp") OR LIMIT-TO (DOCTYPE, "ch")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (AFFILCOUNTRY, "United States") OR LIMIT-TO (AFFILCOUNTRY, "United Kingdom") OR LIMIT-TO (AFFILCOUNTRY, "Germany") OR LIMIT-TO (AFFILCOUNTRY, "Italy") OR LIMIT-TO (AFFILCOUNTRY, "France") OR LIMIT-TO (AFFILCOUNTRY, "Canada") OR LIMIT-TO (AFFILCOUNTRY, "Netherlands") OR LIMIT-TO (AFFILCOUNTRY, "Spain") OR LIMIT-TO (AFFILCOUNTRY, "Australia") OR LIMIT-TO (AFFILCOUNTRY, "Portugal") OR LIMIT-TO (AFFILCOUNTRY, "Sweden") OR LIMIT-TO (AFFILCOUNTRY, "Switzerland") OR LIMIT-TO (AFFILCOUNTRY, "Greece") OR LIMIT-TO (AFFILCOUNTRY, "Denmark") OR LIMIT-TO (AFFILCOUNTRY, "Belgium") OR LIMIT-TO (AFFILCOUNTRY, "Poland") OR LIMIT-TO (AFFILCOUNTRY, "Finland") OR LIMIT-TO (AFFILCOUNTRY, "New Zealand") OR LIMIT-TO (AFFILCOUNTRY, "Ireland") OR LIMIT-TO (AFFILCOUNTRY, "Norway"))

Search 2:

("nonverbal communication" OR "non-verbal communication") AND (robot* OR "soft robot" OR "soft robotics") AND (interaction* OR "social robot interaction" OR "human-robot interaction" OR "human robot interaction") AND (LIMIT-TO (AFFILCOUNTRY, "United States") OR LIMIT-TO (AFFILCOUNTRY, "United Kingdom") OR LIMIT-TO (AFFILCOUNTRY, "Germany") OR LIMIT-TO (AFFILCOUNTRY, "Italy") OR LIMIT-TO (AFFILCOUNTRY, "France") OR LIMIT-TO (AFFILCOUNTRY, "Canada") OR LIMIT-TO (AFFILCOUNTRY, "Netherlands") OR LIMIT-TO (AFFILCOUNTRY, "Spain") OR LIMIT-TO (AFFILCOUNTRY, "Australia") OR LIMIT-TO (AFFILCOUNTRY, "Portugal") OR LIMIT-TO (AFFILCOUNTRY, "Sweden") OR LIMIT-TO (AFFILCOUNTRY, "Switzerland") OR LIMIT-TO (AFFILCOUNTRY, "Greece") OR LIMIT-TO (AFFILCOUNTRY, "Denmark") OR LIMIT-TO (AFFILCOUNTRY, "Belgium") OR LIMIT-TO (AFFILCOUNTRY, "Poland") OR LIMIT-TO (AFFILCOUNTRY, "Finland") OR LIMIT-TO (AFFILCOUNTRY, "New Zealand") OR LIMIT-TO (AFFILCOUNTRY, "Ireland") OR LIMIT-TO (AFFILCOUNTRY, "Norway")) AND (LIMIT-TO (SUBJAREA, "COMP") OR LIMIT-TO (SUBJAREA, "ENGI") OR LIMIT-TO (SUBJAREA, "NEUR") OR LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "PSYC")) AND (LIMIT-TO (DOCTYPE, "ac") OR LIMIT-TO (DOCTYPE, "cp") OR LIMIT-TO (DOCTYPE, "ch")) AND (LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-TO (PUBYEAR, 2010)) AND (LIMIT-TO (LANGUAGE, "English"))

Soft Robotics



Process

- **Justification for inclusion or exclusion of a study**
 - Opens up the students' horizons
 - What has been done, what worked and what is possible
 - Boosts creativity and innovation
 - Background work and theoretical framework ready

Title and Authors	Included or Excluded?	Reason for Inclusion or Exclusion
<i>Social robotic donuts</i> Bewley, Harvey Boer, Laurens	Included	<ul style="list-style-type: none">• A soft robot looking like a donut but with 3 chambers inside making it capable of doing motions made by a variation in air pressure inside each of the 3 chambers.• The design technique and casting <u>is</u> very good and we need to look into this for inspiration when designing our own prototypes
<i>Adaptive Neural CPG-Based Control for a Soft Robotic Tentacle</i> Jeppesen, Marlene Hammer Jørgensen, Jonas <u>Manoonpong, Poramate</u>	Included	<ul style="list-style-type: none">• A soft robotic tentacle also with chambers, that we also can use for inspiration.
<i>Augmenting soft robotics with sound</i> Bering Christiansen, M. Jørgensen, J.	<u>Included</u> <u>(Maybe)</u>	<ul style="list-style-type: none">• The sound robot tries to do some human-robot interaction• Can be used to talk about human-robot interaction• (This is the <u>Sono</u> robot)
<i>The breathing wall (<u>Brall</u>)—triggering life (in)animate surfaces</i> <u>Budak, E. P.</u> <u>Zirhli, O.</u> <u>Stokes, A. A.</u> Akbulut, O.	<u>Included</u>	<ul style="list-style-type: none">• A breathing wall created to feel like flesh.• The wall breathes, emit <u>sound</u> and respond to touch by pneumatic activation.• Focuses on social experience between the interaction of humans and the soft robot wall.• The authors believe that combining a flesh like material with soft motion and tactile responsiveness brings us closer to replicating/imitating organic life.



Process

- **Data Management Plan**
 - Makes students think through all the phases of their project from the beginning
 - Helps them have a better understanding of their datasets

DATA COLLECTION

Collected data will be subjective data from test subjects watching videos of one or more soft robots moving. The test group will be 20 or more test subjects. Most of the questions in the questionnaire relates to the Self-Assessment Manikin (SAM) scale, where the test subjects are asked to relate to the motions/behavior of the soft robot.

The size of the data collected is expected to be the size of 10 MB, not counting the videos used for the questionnaire.

In the questionnaire the test subjects will be asked to inform on personal information. This will be their *age* and *biological gender*.

The data will be created from questionnaires and stored in excel format. Qualitative answers will be logged in Word or text files. A consistent system of file naming and an organized folder structure will ensure easy retrieval. This will involve creating meaningful but brief file names including for example "date, content, creator name, version, status".

The questionnaire will be created using SurveyXact.

The data will be analyzed in MATLAB using statistics.

We will follow the standards stated at the Danish Code of Conduct for Research Integrity.

DOCUMENTATION AND METADATA

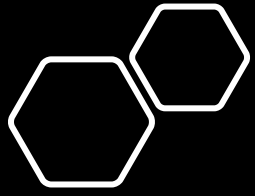
In order to have meaningful datasets that could be read and be understood, they will be accompanied by an overview document (README file) covering the details regarding the purpose and methodology of the data collection, the file formats and structure, and whatever else makes sense like the dates and places of the experiment, user guides for the experiments, statistical code, software used for the design, materials of the prototype etc. Note that certain details will be kept vague to preserve anonymity.

The metadata will be stored in Microsoft OneDrive.

ETHICS AND LEGAL COMPLIANCE

The project includes data with personal information relating to the test subjects.

All participants are thoroughly informed about the purpose of the project before any information is asked and stored. Test subjects are anonymous, and all the test subjects can withdraw their consent at any time unless the data has been anonymized (meaning the questionnaire has been submitted to us), and therefore the test subjects and their corresponding questionnaire cannot be identified by us again.



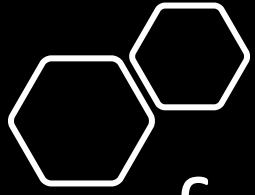
Results

- Unanimous Bachelor Thesis grade 12 out of 12
- Troels Aske Klausen, Ulrich Farhadi, Evgenios Vlachos, Jonas Jørgensen (2022). *Signalling Emotions with a Breathing Soft Robot*, 2022 IEEE 5th International Conference on Soft Robotics (RoboSoft), IEEE **(ACCEPTED)**
- Ulrich Farhadi, Troels Aske Klausen, Jonas Jørgensen, Evgenios Vlachos (2022). *Exploring the Interaction Kinesics of a Soft Social Robot*, International Conference on Human Computer Interaction (HCI), Springer. **(ACCEPTED)**



HCI International 2022

26 June-1 July • Virtual



What's in it for the Library?

- Satisfied “customers” -
Word-of-Mouth Marketing

- Students
- Teachers
- Departments

Consumers talk about a company's product or service to their friends, colleagues, and to others with whom they have close relationships.



What's in it for the Library?

- Satisfied “customers” -
Word-of-Mouth Marketing
- Increased Demand

We are up-to-date, relevant and improve the quality of the research outputs.



What's in it for the Library?

- Satisfied “customers” - Word-of-Mouth Marketing
- Increased demand
- Understand user needs & offer better services



We also learn from this process and develop new competences.