

Pro-tips to enhance your research equations

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EPFL Library

Coffee Lecture
#02

Nov 10, 2020

Learning objectives

- Know how to improve a research equation
- Get an overview of the tips to refine the scope of your research equation

Structured search

- Start early
- Be strategic

- Step 1: Check your research question
- Step 2: Extract the concepts
- Step 3: Find all the keywords ! (+ their translations, abbreviations...)
- Step 4: Build a research equation
- Step 5: ... Learn and adapt !

Keywords and synonyms

Coffee Lecture #02 – Enhance your research equations

Soft Robotics, Vol. 7, No. 1 | Original Articles

Closed-Loop Haptic Feedback Control of a Self-Sensing Soft Pneumatic Actuator

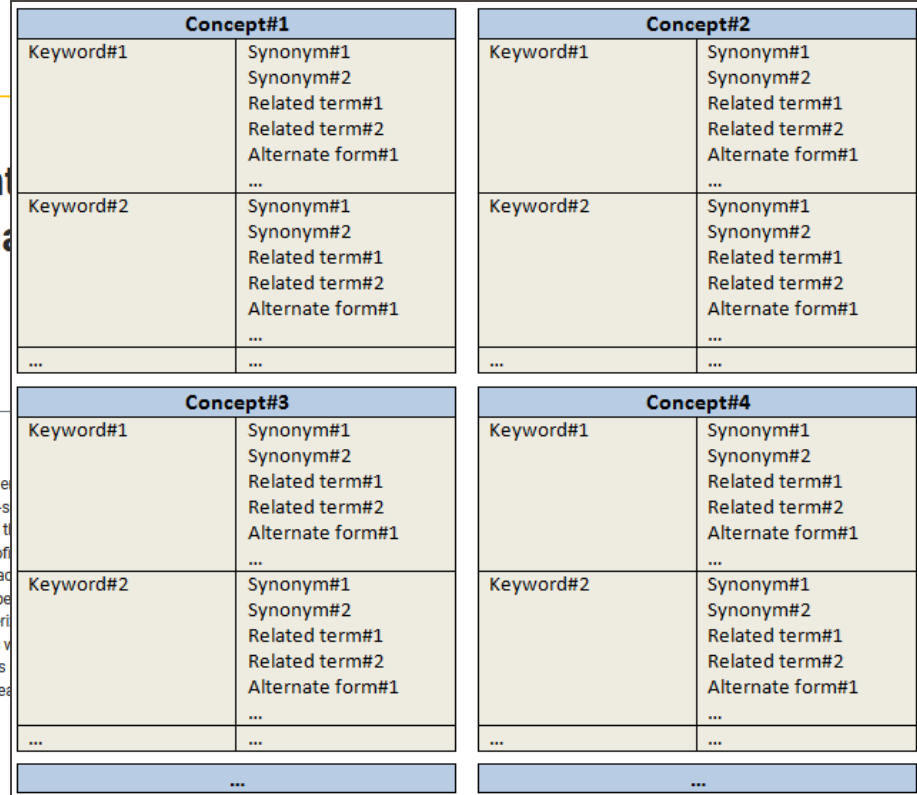
Harshal A. Sonar, Aaron P. Gerratt, Stéphanie P. Lacour, and Jamie Paik

Published Online: 6 Feb 2020 | <https://doi.org/10.1089/soro.2019.0013>

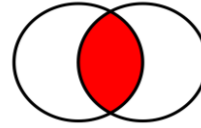
[View article](#)

Abstract

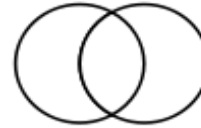
In this article, we achieve a closed-loop control over haptic feedback, first time for an embedded self-sensing soft pneumatic actuator (SPA) with soft strain sensors, called SPA-sensors, which are capable of high-frequency sensing and actuation. To close-loop control the actuator requires a cohesively integrated system. Our system consists of a stretchable low profile compliant thin-metal film strain sensor that create a novel bidirectional platform for tactile vibratory feedback. With this prototype, we demonstrated control of the actuator shape forces up to 1 N, maintained under variable mechanical loadings. We further characterized static and dynamic behavior over a range of actuation amplitudes and frequencies as well as of this system to predict the actuator inflation state only using the embedded sensor's multifunctional multilayer system that can readily be implemented as a high-speed wearable contact sensing and vibrotactile feedback.



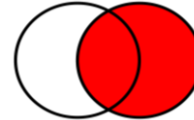
- **AND** to combine key concepts



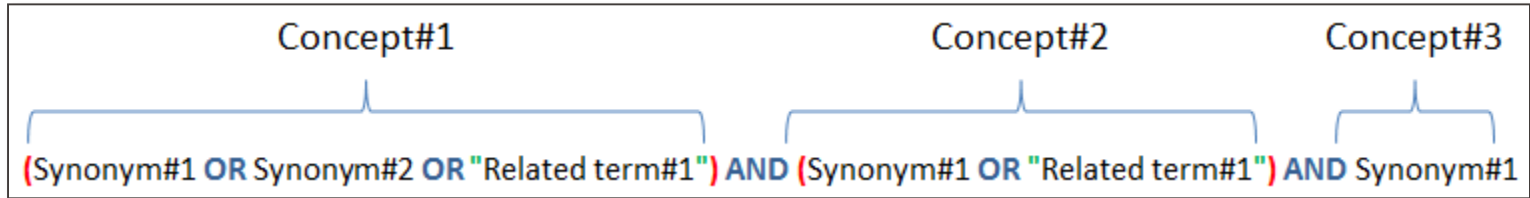
- **OR** to add key concepts



- **NOT** to exclude concepts



Research equation



(visual OR retin* OR "optic nerve" OR "visual cortex" OR vision OR phosphene OR eye) AND (prothes?s OR artificial OR "electrical stimulation" OR bionic)

(visual OR retin* OR "optic nerve" OR "visual cortex" OR vision OR phosphene OR eye) AND (prothes?s OR artificial OR "electrical stimulation" OR bionic)

- Truncation with *
- Wildcards with ?
- Phrase searching with «»

Is it the equation of your dreams?

- Noise VS Silence
- Check your search results, read abstracts
- Do another iteration

Source : Web of Science Core Collection
Date : October 24, 2020

#	Equation	Search Fields	Filters	# of results	Relevant references	Observations
1	(visual OR retina OR "optic nerve" OR "visual cortex" OR vision OR phosphene OR eye OR retinal) AND (prosthesis OR artificial OR "electrical stimulation" OR bionic OR prostheses)	Topic		1'256	Not checked	Add truncation of retin*, Refine to date
2	(visual OR retin* OR "optic nerve" OR "visual cortex" OR vision OR phosphene OR eye) AND (prosthesis OR artificial OR "electrical stimulation" OR bionic OR prostheses)	None	Date: 2010-2020	761	Not checked	Combine with ...

- Keep note of what works
- Set up alerts

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