Literature study / search / review

– What, Why and How? –

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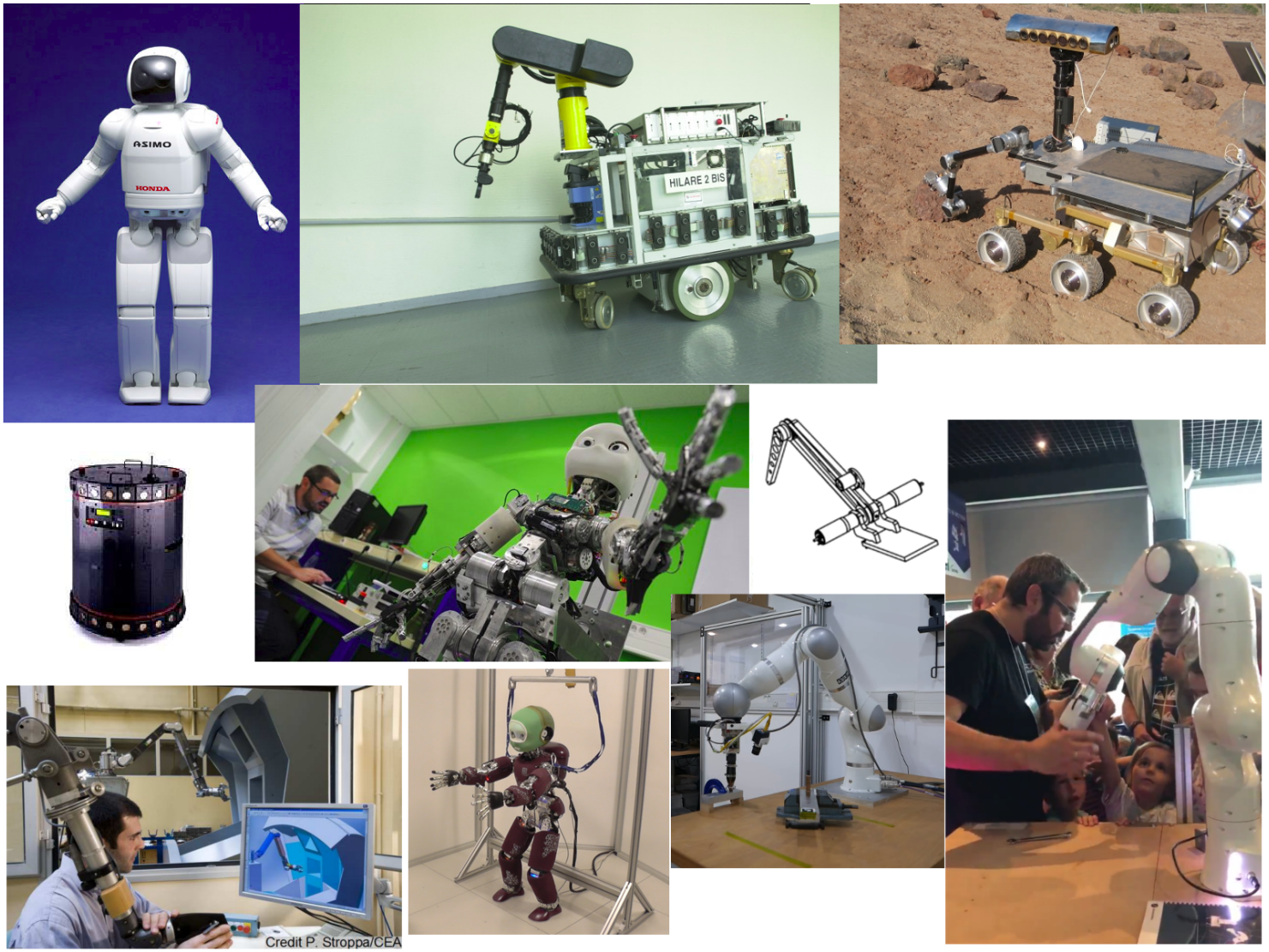
Outline of the presentation

1. Foreword
   - Objectives of this short course
   - Why is this short course important?
2. Literature review: what and why?
   - What is a literature review? [The Royal Literary Fund 2018]
   - What is NOT a literature review? [The Royal Literary Fund 2018]
   - Why would I prepare one? [The Royal Literary Fund 2018]
3. Literature review: how to proceed?
   - The 5 or 6 questions trick...
   - How to start?
   - Where to search and who should you trust?
   - Useful tools
4. Instructions for a proper technical report

Objectives of this short course

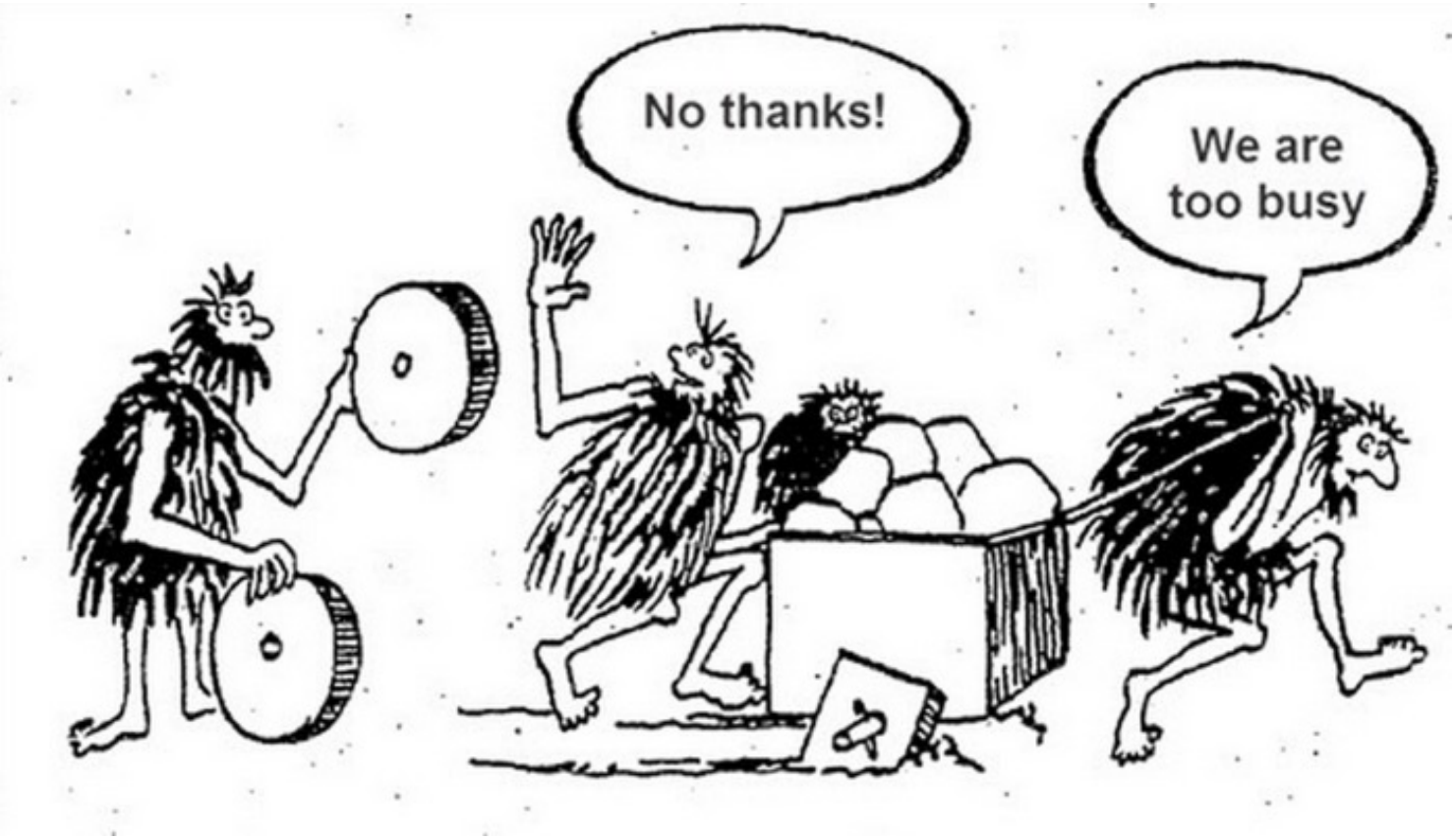
The very specific objective of this short course is to provide you with **knowledge**, **methodological insights** and **tools** to prepare the litterature reviews related to your projects.

I have worked with quite a few robots...



Sources: Honda, CEA LIST, NASA JPL, Nomadics, Banque d'images personnelles

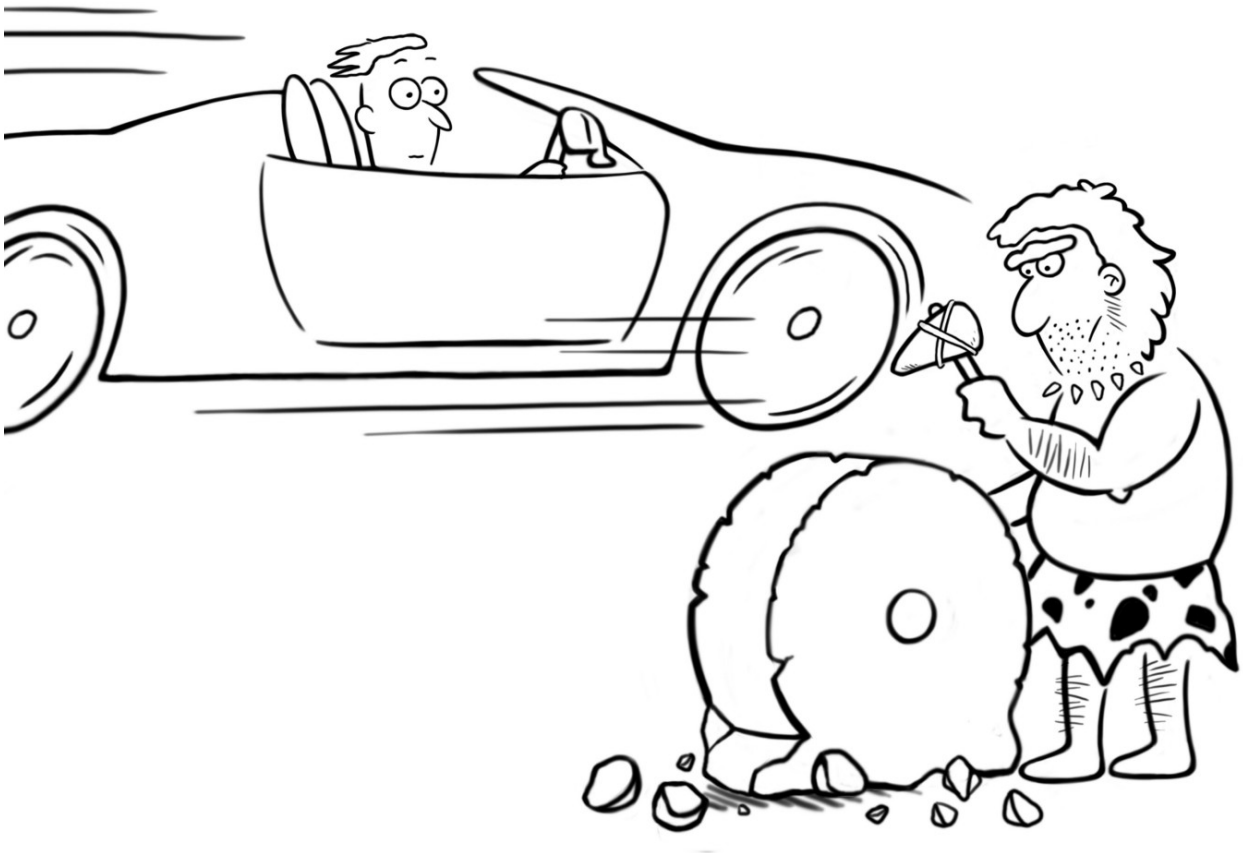
I have seen many people ignoring the wheel



Source: https://medium.com/@nuwan.senaratna/reinventing-the-wheel-f4a2152d9f27

...because they understimated the necessity of a proprer literature review.

I have seen many people reinventing the wheel



Source: inconnue

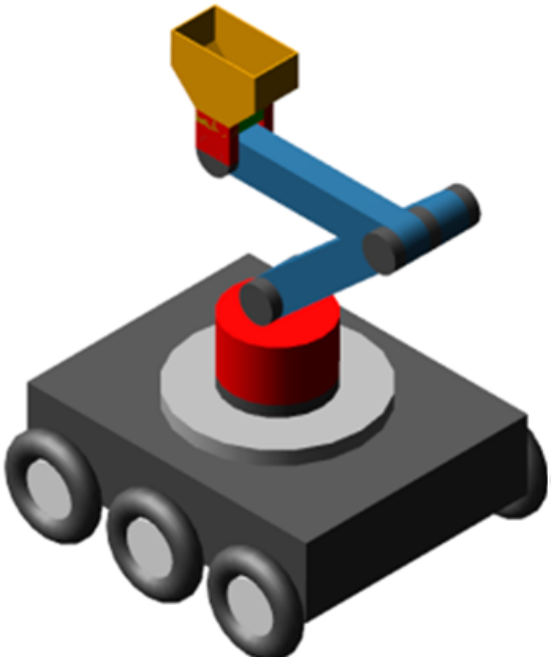
...because they understimated the necessity of a proprer literature review.

I have seen many people misinterpreting the wheel

Source: http://www.startupdaily.net/2012/10/reinventing-the-wheel/

...because they understimated the necessity of a proprer literature review.

3 simple examples in Robotics



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What is a literature review? [The Royal Literary Fund 2018]

"A literature review is a search and evaluation of the available literature in your given subject or chosen topic area. It documents the state of the art with respect to the subject or topic you are writing about. It has four main objectives:

1. it surveys the literature in your chosen area of study;
2. it synthesises the information in that literature into a summary;
3. it critically analyses the information gathered by identifying gaps in current knowledge; by showing limitations of theories and points of view; and by formulating areas for further research and reviewing areas of controversy;
4. it presents the literature in an organised way."

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What is a literature review? [The Royal Literary Fund 2018]

"A literature review shows your readers that you have an in-depth grasp of your subject; and that you understand where your own work fits into and adds to an existing body of agreed knowledge. A literature review:

1. demonstrates a familiarity with a body of knowledge and establishes the credibility of your work;
2. summarises prior work and says how your project is linked to it;
3. integrates and summarises what is known about a subject;
4. demonstrates that you have learnt from others and that your work is a starting point for new ideas."

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What is NOT a literature review? [The Royal Literary Fund 2018]

Here are some things to bear in mind when researching and writing your literature review.

- It is not a descriptive list.
- It is not a website by website, book by book and article by article summary.
- It is not a survey of every single thing that's ever been written about your topic.
- It is not a catalogue of existing products (even though existing products may appear in your literature review).
- It is not a list of specifications ("cahier des charges" in French).
- It is not a technical manual.
- It must be defined by a guiding concept/question and/or a technical/scientific project or objective.
- It must tell the reader what knowledge and ideas have been established and agreed in your area and outline their strengths and weaknesses.

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Why would I prepare one? [The Royal Literary Fund 2018]

The first step of any scientific / technical project is to review the field: surveying, synthesising, critically analysing and presenting it. A literature review is useful:

- To be intelectually honest and give credit to the existing work that inspires you own work (actually not doing that is called **plagiarism** and may lead you to being prosecuted at the penal level).
- To identify other people working in the same field. Knowing who's already working in your area and getting in touch with them can be an invaluable source of knowledge and support.
- To provide an intellectual context for your own work, and enable you to position your project in relation to others in the field.
- Puts your own work in perspective – are you doing something completely new, revisiting an old controversy in the light of new evidence, etc?
- To provide a technical/scientific overview of a given topic and:
  - be knowledgeable / become an expert of that topic and demonstrate the depth of your knowledge about your work;
  - make enlightened scientific / technical choices: neither reinvent the wheel nor ignore the difficulties of potential improvements to known limits in the domain;
  - be credible, e.g. wrt your hierarchy when exposing your working plan and requesting budget for it, by showing that you are building on a foundation of existing knowledge and ideas.

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The 5 questions trick

What questions should you answer?

1. What is the general context of your project and the central theme(s)?
2. What are the scientific/technical questions/diffiuclties it raises?
3. Are these questions solved? How does existing work/studies relate to my problem?
   - ! This is what your litterature review should answer !
4. Why are the limits of existing solutions and why don't they answer your problems?
5. How is your literature review organized?

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The 6 questions trick (if your project goes beyond the literature)

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How to start?

What is the general context of your project and the central theme(s)?

1. Try to figure out what is central and what is not in your project topic.
   - "Adaptive control approaches in Robotics: application to flying robots for the agriculture context" $\rightarrow$ What is central? What is secondary?
2. Present your first analysis of where to focus to your "clients" and get feedback from them.
   - "Actually what is important for me is really the **control of flying robots**"
   - "The **constraints imposed by the agriculture context on the flying modes** is really the key question"
   - "The applicative context is here to examplify but what I really care about is **Adaptive control approaches in Robotics**"
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   - "Adaptive control approaches in Robotics: application to flying robots for the agriculture context" $\rightarrow$ What is central? What is secondary?

2. Present your first analysis of where to focus to your "clients" and get feedback from them.
   - "Actually what is important for me is really the **control of flying robots**"
   - "The **constraints imposed by the agriculture context on the flying modes** is really the key question"
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Where to search and who should you trust?

You have to use search engines in physical or digital places: libraries or the internet. You should target:

- Your courses (!)
- Books, Handbooks and textbooks
- General audience publications and magazines: “Les Techniques de l’Ingénieur”, “Hackable magazine”, “Le Monde des Sciences”, “ÌEEE Spectrum”,...
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- Sources which have been peer-reviewed.
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Useful tools

- Managing your references: many alternatives[1]
- Within the framework of this project, you may use Zotero and make the needful so that interested can access your "library"
- Dedicated search engines: Google Scholar, IEEE Xplore, and others (Springer, Elsevier,...)
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[1] Comparison of reference managgement softwares

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Outline of the presentation

1. Foreword
   - Objectives of this short course
   - Why is this short course important?
2. Literature review: what and why?
   - What is a literature review? [The Royal Literary Fund 2018]
   - What is NOT a literature review? [The Royal Literary Fund 2018]
   - Why would I prepare one? [The Royal Literary Fund 2018]
3. Literature review: how to proceed?
   - The 5 or 6 questions trick...
   - How to start?
   - Where to search and who should you trust?
   - Useful tools
4. Instructions for a proper technical report

Instructions for a proper technical report

Cf. le fichier rapport.pdf.

References

The Royal Literary Fund.
What is a literature review?
https://www.rlf.org.uk/resources/what-is-a-literature-review/, 2018.
Accessed: 2018-10-01.

Thank you for your attention

Au boulot !