Chalmers University of Technology
Department of Mechanics and Maritime Sciences

Home problem 1, TIF160/FIM800 Humanoid robotics, September 2, 2021.
Teacher: Krister Wolff, telephone 031-772 3625.

IMPORTANT, read first!

1. You should provide your essay in the form of a **pdf-file**. Furthermore, it is *strongly* recommended to use LaTeX.

2. Submit your essay via Canvas LMS. The file should be named `YourNameHP1.pdf`, where YourName should be replaced by *your* name.

3. As for the length, your text (excluding references) should contain **1,500 to 3,000 words** (about 3 to 5 pages).

4. Clearly separate between *your own* reflections, and reflections from any references that you might use (e.g. "One might argue..." or "I would like to argue...").

5. All references must be cited properly, e.g. using the APA style referencing.

6. References should be of high relevance to what you are writing about.

7. You **MUST** refer to at least two scientific papers (or books) in your text.

8. Grading: For the grade 3, a well-written essay based on two or more referenced works is needed. For the grade 4, it is also needed to make well-motivated *own* reflections based on the references. For the grade 5, it is also needed that all content (including own reflections) is very well composed in terms of logical order (i.e. flow) and that the text captures a very broad scope.

9. The text will be automatically tested in Urkund, and cases of suspected plagiarism will be reported to the university disciplinary committee.

10. Please write your name and civic registration number on the front page of the report.

11. Refer to the course homepage in Canvas for the deadline of submission.

Topic:

Please write a coherent and broad-scope essay, reflecting what you have learned during the course. Based on the state-of-the-art, focus on the following three main pillars:

Future Applications From a society point of view, discuss the future role of full-scale humanoid robots, i.e. robots that can to a high degree share human infrastructure, culture, and social mechanisms. As a starting point, choose an application area of humanoids (refer to the Introduction lecture), and include specific challenges within that area.

Societal Impact Describe how humanoid robots could be expected to help and interact with people in their everyday life, and any ethical or social problems that might emerge. Also, based on the needs and acceptance within different areas of society, try to give a realistic time for *when* humanoid robots can be widely integrated into society.

Research Directions Based on the covered topics in the lectures (i.e. cognition, perception, control, etc.) and scientific articles that you find, what future research directions seem to be application-oriented answering the societal needs and which fundamental research needed before humanoid robots reach the envisioned human-like capabilities in perception, cognition, dexterity and long-term autonomy.

Regarding scientific literature references for your work, see (1) the course literature listed in Canvas, and in the Humanoid robotics compendium, and (2) use a scientific literature database, such as e.g. Google Scholar[1].

The main point is that you make your own investigation, and write your own reflections. Do not just repeat what have been said on the lectures or in the literature. That should just be used as the basis of your investigation and arguments!

Good Luck!

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[1] https://scholar.google.com/