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M A S T E R ' S   T H E S I S
for
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Human-like Walking Pattern Design for Humanoid Robots

Problem description:

Human motion imitation is an effective paradigm to acquire expressive human-like movements for humanoid robots with large number of degrees of freedom. An online whole-body motion imitation algorithm has been proposed based on task space tracking [1]. However it is hard to describe the walking motion just through task space markers considering the motion similarity. In [2] by combining task and joint space tracking based on quadratic programming online human-like walking imitation is realized. Most of the state-of-the-art walking pattern generators do not consider the motion similarity problem and their goal is focused on generating a stable walking motion. In this master thesis the student is going to tackle the motion similarity problem and design the walking motion pattern according to the human walking motion data and the robot physical constraints.

Tasks:

- Literature research of walking motion pattern generation.
- Develop and implementation of human-like walking motion pattern generator.
- Simulate the walking motion pattern and summarize the results.
- Write final report.

Bibliography:

[1] Kai Hu and Dongheui Lee. Prediction-based synchronized human motion imitation by a humanoid robot. *at-Automatisierungstechnik*, 60(11):705–714, 2012.
[2] Kai Hu, Christian Ott, and Dongheui Lee. Online human walking imitation in task and joint space based on quadratic programming. IEEE, 2014.

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