03.03.2016

B A C H E L O R   T H E S I S

Generalization of Compensative Zero-Moment Point Trajectories for Biped Walking

Problem description:

The state of the art of online biped walking control is based on walking pattern generation and trajectory tracking along the pre-planned trajectories based on joint position control [1]. In the walking pattern stage simplified models are used in order to reduce the computational cost and realize real time implementation. However this introduces model inconsistency problem and causes zero-moment point (ZMP) tracking error. A learning algorithm has been proposed to learn compensative ZMP (CZMP) trajectories from walking trials [2]. This bachelor thesis is aiming at exploring the generalization ability of learned CZMP using different machine learning algorithms.

Tasks:

- Study different machine learning algorithms for generalization purpose.
- Apply different machine learning algorithms for CZMP trajectories.
- Evaluate the generalization result in simulation
- Documentation

Bibliography:

[1] Kajita, S., Kanehiro, F., Kaneko, K., Fujiwara, K., Harada, K., Yokoi, K. and Hirukawa, H. Biped walking pattern generation by using preview control of zero-moment point. In *IEEE/RSJ International Conference on Robotics and Automation, 2003*.

[2] Kai Hu, Christian Ott, and Dongheui Lee Online Iterative Learning Control of Zero-Moment Point for Biped Walking Stabilization. In *IEEE/RSJ International Conference on Robotics and Automation, 2015*.

Supervisor: M.Sc. Kai Hu
Start: xx.xx.2016
Intermediate Report: xx.xx.2016
Delivery: xx.xx.2016

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