

A simple pattern generator for biped walking

Olga Jarzyna, Dariusz Grzelczyk, Jan Awrejcewicz

Abstract: The paper proposes a simple model of a central pattern generator for bipedal walking. The model approximates the angular positions of hip, knee and ankle joints during walking considered in the sagittal plane. The proposed mathematical representation of the walking pattern generator is based on experimental observations of healthy volunteer's gait. It consists of three piecewise-defined continuous and smooth sine-squared-based functions approximating the angular positions of particular joints within a gait cycle. The model can be potentially employed to generate signals controlling motion of an exoskeleton for rehabilitation of lower limbs. It can be easily modified by changing the values of model parameters. The proposed model can be also potentially implemented in control of bipedal robots in the future.

-
- ¹⁾ Olga Jarzyna, M.Sc. (Ph.D. student): Lodz University of Technology, 1/15 Stefanowskiego St., 90-924 Łódź, Poland (PL), olga.jarzyna@edu.p.lodz.pl.
 - ²⁾ Dariusz Grzelczyk, Ph.D.: Lodz University of Technology, 1/15 Stefanowskiego St., 90-924 Łódź, Poland (PL), dariusz.grzelczyk@p.lodz.pl.
 - ³⁾ Jan Awrejcewicz, Professor: Lodz University of Technology, 1/15 Stefanowskiego St., 90-924 Łódź, Poland (PL), jan.awrejcewicz@p.lodz.pl.