15th INTERNATIONAL CONFERENCE
Dynamical Systems — Theory and Applications
December 2-5, 2019. Lodz, POLAND.

DSTA 2019

paper id: MAT63

Uncertainties in the movement and measurement of a hexapod robot

Péter Ordy, István Kecskés, Ákos Ordy

Abstract: The uncertainties can be defined using the simulation model and real values, and, thus, practically represent the model's accuracy. All differences between the simulation and the reality create inaccuracy and uncertainty. Our previous research presented numerically these inaccuracies and point out some structure imperfections of the Szabad(ka)-II hexapod robot. Uncertainty variables can be divided into three groups in a optimization problem: physical, design, and scenario uncertainties. The physical uncertainties occur in the parts of the model where the model has estimated or approximate solutions. The scenario uncertainties are related to the scenario parameters in a multi-scenario approach, whereas the optimized (design) variables carry the design uncertainties. The sequential and parallel measurement made on Szabad(ka)-II robot shows more or less uncertainties between the left and right side, between front and rear legs, between current and voltage sensors and repetition of same walking scenario. The differences observed from same scenario are compared difference between different scenarios. There are also deviation in the first walking step compared to the rest steps. The 6-axis accelerometer signals are analyzed both in time and frequency domain. Before optimize any kind of robot motion and structural quality the measurement errors and uncertainties should be estimated. It is also necessary to define the expected quality optimum, and interpret correctly the simulation results and imperfections.

[1)] Péter Ordy, Ph.D.: University of Dunaújváros, 24413 Palic, Serbia (RS), PODRY@uniduna.hu .

[2)] István Kecskés, Ph.D.: University of Dunaújváros, Jasenovacka 16, Subotica 24000, Serbia (RS), kecskes.istvan@gmail.com .

[3)] Ákos Ordy, M.Sc. (Ph.D. student): University of Dunaújváros, 24000 Subotica, Serbia (RS), odrya@uniduna.hu .