Design of a Robust Controller for Inverted Pendulum

International Journal of Computer Applications
© 2015 by IJCA Journal

Volume 112 - Number 16

Year of Publication: 2015

Authors:
Arunesh Kumar Singh
D.K.Chaturvedi
Nitin Kumar Pal

10.5120/19752-1161

Abstract

In this paper, robust controller is developed by using H8 controller to improve the performance of the Invert Pendulum. In this paper, introduced a controller by combining the classical PID, the fuzzy controllers and H8 controller and thus a new controller has been achieved. The simulations done on inverted pendulum using the new H8 fuzzy PID controller provides better system responses in terms of transient and steady-state performances when compared to the pure classical PID or the pure fuzzy controller applications.

References

- J. Lam, “Control of an Inverted Pendulum”, University of California, Santa Barbara, 10 June 2004.
- Yanmei Liu and Zhen Chen, Dingy Xue, Xinhe Xu “Real-Time Controlling of Inverted Pendulum by Fuzzy” Proceedings of the IEEE International Conference on Automation and Logistics Shenyang, China August 2009
- Marzi Hosein, “Fuzzy Control of an Inverted Pendulum using AC Induction Motor Actuator” IEEE International Conference on Computational Intelligence for Measurement Systems and Applications La Coruna - Spain, July 2006
- Songmoung Nundrakwang, Taworn Benjanarasuth, Jongkol Ngamwiwit and Noriyuki Komin, “Hybrid Controller for Swinging up Inverted Pendulum System”, ELITE, CMS, 2005
- Katsuhiko Ogata “Modern control Engineering” university of Minnesota, prentice hall, Upper Saddle River. New Jersey 07458

- Theory of Robust Control by Carsten Scherer Mechanical Engineering Systems and Control Group Delft University of Technology the Netherlands
- Yasunobu Seiji and Yamasaki Hiroaki, “Evolutionary Control Method and Swing Up and Stabilization Control of Inverted Pendulum”, Joint 9th IFSA World Congress and
- Ben M. Chen, Robust and H8 Control, Springer-Verlag, 2000.
- Hosein Marzi “Fuzzy Control of an Inverted Pendulum using AC Induction Motor Actuator” IEEE International Conference on Computational Intelligence for Measurement Systems and Applications La Coruna - Spain, 12-14 July 2006
- Zhao Yang, Xiao Xiangning, Member, IEEE , Xudong Jia “Nonlinear PID Controller of H-Bridge Cascade SSSC Top Level Control” DRPT2008 6-9 April 2008 Nanjing China.
- Lin Wang, Shifu Zheng, Xinpang Wang and Liping Fan “Fuzzy Control of a Double
Inverted Pendulum Based on Information Fusion” International Conference on Intelligent Control and Information Processing August 13-15, 2010 - Dalian, China

- Meysam Ghanavati, Vahid Johari Majd and Malek Ghanavati “Control of Inverted Pendulum System by using a new Robust Model Predictive Control Strategy” 2011 International Siberian Conference on Control and Communications SIBCON.


Index Terms

Computer Science

Applied Sciences

Keywords

Inverted Pendulum  PID Controller  Fuzzy Logic controller