COMPARISON OF PARAMETER VARIATION SENSITIVITY USING TWO CONTROL METHODOLOGIES FOR HSM60 SERVOMOTOR

Hošovský Alexander
Faculty of Production Technology, Presov, Slovak Republic.

The control of DC servomotors used in robotics is usually carried out using conventional PI controllers that might serve their purpose well in case of absence of any parameter variation. Nevertheless, this is rarely case in practice as with any change in load the inertia moment is naturally changed resulting in much worse performance of a PI controller. The main topic of this paper is the comparison of two possible control methodologies for decreasing the parameter variation sensitivity of the whole control system : acceleration loop and fuzzy controller. It is shown that even a basic fuzzy controller with rather small number of fuzzy rules (computationally undemanding) performs very well even under conditions of extreme inertia moment variation and is capable of outperforming a conventional method of using acceleration loop.

Keywords: fuzzy controller, acceleration loop, inertia moment, oscillatory response

REFERENCES

[1] BALARA, Milan. *A robust servosystem of an industrial robot*. Transactions of the Technical University of Košice. Košice : Technical university, 1992. vol. 2, no. 2 (1992), p. 251-257. ISSN 0960 6076.

[2] BALÁTĚ, Jaroslav. *Automatické řízení*. Praha, BEN 2004. 663 p. ISBN 80-7300-148-9

[3] JENTZEN, Jan. *Foundations of Fuzzy Control*. John Wiley&Sons 2007. 209 p. ISBN 0-470-02963-3

[4] KOVAČIČ, Zdenko; BOGDAN, Stepan. *Fuzzy Controller Design*. Theory and Applications. Taylor&Francis 2006. 392 p. ISBN 0-8493-3747-X

[5] NOSKIEVIČ, Petr. *Modelování a identifikace systému*. Montanex 2007. 276 p. ISBN 80-7228-030-2

[6] NOVY BOR, REGULACE – AUTOMATIZACE BOR spol. s.r.o. Stejnosměrné motory HSM. Katalog výrobku

[7] PASSINO, M. Kevin; YURKOVICH, Stephen. *Fuzzy Control*. Addison-Wesley 1998. 502 p. ISBN 0-201-18074-X