



## QUANTITATIVE FEEDBACK THEORY-BASED ROBUST CONTROL FOR A SPINDLE OF LATHE MACHINE

M. Khairudin

<sup>1</sup>Department of Electrical Engineering Education, Faculty of Engineering

Universitas Negeri Yogyakarta, Karangmalang 55281

Yogyakarta, Indonesia

Emails: moh\_khairudin@uny.ac.id

---

*Submitted: July 3, 2016*

*Accepted: Oct. 21, 2016*

*Published: Dec. 1, 2016*

---

*Abstract- This paper presents theoretical and experimental design of a robust control based on quantitative feedback theory (QFT) approach to control deepness variations on cutting process for a spindle of lathe machine. The dynamics of a spindle is uncertain and varying due to deepness variation on cutting process. Practical design steps are explained in which QFT based conditions are assembled to obtain a compensator and pre-filter gain to control a spindle. The robust controller show an advantage control the system under various cutting conditions. The performances of the proposed controller are evaluated in terms of input tracking capability of the spindle responses and speed responses of a spindle incorporating deepness on cutting process. Experimental results show that QFT based robust control provides the improvement of robustness and performances.*

**Index terms:** experimental, lathe, QFT, spindle, robust control.