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Short Biography:

Christoph Klarenbach studied electrical engineering from 2001 to 2006 at Wuppertal University where he became a Master of Science in 2006. He focuses on the areas of control and drive technology as well as power electronics. He is currently working on his doctoral thesis in the field of drive control using FPGAs. This research project is sponsored by Beckhoff Automation, Germany.

Title of the Paper:

Fast and High Precision Motor Control for High Performance Servo Drives

Summary of the Paper:

This paper reports a new architecture of a fast current controller with two feedback signals for high performance motion control. Due to parallel processing inside the Field Programmable Gate Array (FPGA), the control algorithm computing time is significantly less than $1 \mu\text{s}$. Together with advanced control technologies in combination with a new current observer the bandwidth of fast switching IGBT or MOSFET power stages is not limited by the delay time of high precision (integrating) current measurement any longer. Using that technology high control bandwidth in conjunction with high precision current control is now possible at no trade off. The control strategy relies on a simplified machine model without incurring performance degradations. The presented results have been produced with a high speed Computerized Numerical Controlled (CNC) machine (high speed lathe).