EMERGING RESEARCH FRONTS - 2009

April 2009

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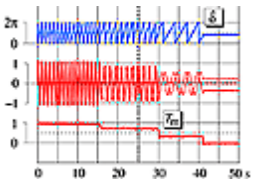
Joachim Holtz talks with *ScienceWatch.com* and answers a few questions about this month's Emerging Research Front Paper in the field of Engineering. The author has also sent along an image of his work.

Article: Sensorless control of induction machines - With or without signal injection?
Authors: Holtz, J
Journal: IEEE TRANS IND ELECTRON, 53 (1): 7-30 FEB 2006
Addresses: Univ Wuppertal, Elect Machines & Dr Grp, D-42097 Wuppertal, Germany.
Univ Wuppertal, Elect Machines & Dr Grp, D-42097 Wuppertal, Germany.

SW: Why do you think your paper is highly cited?

It introduces novel solutions to a topic of current research, and combines this with an in-depth, state-of-the-art analysis. I know from many inquiries that the subject is of interest both to industries and academic researchers.

Figure 1:



+ View larger image & details

SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

It describes a new methodology and provides a synthesis of knowledge.

SW: Would you summarize the significance of your paper in layman's terms?

Theory tells us that an induction motor is not observable when operating at a low speed of rotation. This means that control of the motor speed is not possible without using a speed sensor. The new method overcomes this obstacle using a trick. Eliminating a speed sensor leads to cheaper and more reliable motor drives.

SW: How did you become involved in this research and were any particular problems encountered along the way?

Research is one of my obligations as a university professor. I become aware of any unsolved problems in my capacity as an industrial consultant.

SW: Do you foresee any social or political implications for your research?

I expect few social or political implications as a result of this research.

Professor Joachim Holtz
Head of the Electrical Machines and Drives Laboratory
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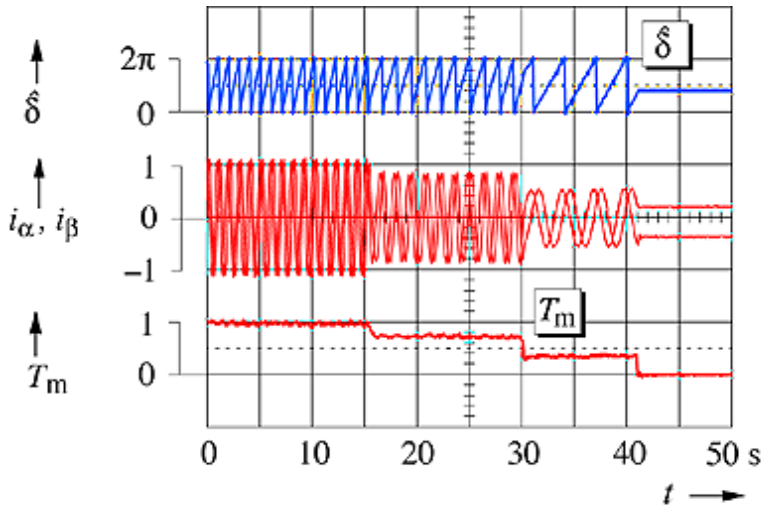
Wuppertal, Germany

Figure 1:



Sensorless operation of an induction motor at zero speed, load reducing in steps from 120% nominal to no-load. Traces from top: 1. Angular position of the magnetic field, 2. motor currents, 3. mechanical torque at the motor shaft

KEYWORDS: ADAPTIVE TUNING; IDENTIFICATION; INDUCTION MOTOR; MODELING; OBSERVERS; SENSORLESS POSITION CONTROL; SENSORLESS SPEED CONTROL; SIGNAL INJECTION; VECTOR CONTROL.

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