

## **TECHNICAL PAPERS**

## OF THE TWENTIETH

## **INTERNATIONAL**

# INTELLIGENT MOTION 1991

## CONFERENCE

SEPTEMBER 22-27, 1991 UNIVERSAL CITY (LA), CALIFORNIA

This Book is the Property of

**INTELLIGENT MOTION • SEPTEMBER 1991 PROCEEDINGS I** 

## **INTELLIGENT MOTION '91 - SEPTEMBER TABLE OF CONTENTS**

Technical Papers and Authors	Session No.	Page No.
Motor/Actuator Design Using the Computer to Select Small Brushless DC Motors as a Function of Motor Performance Characteristics		
-Dan Jones, Incremotion Associates Inc	IM1.1	1
A High-Power-Density Switched Reluctance Motor —A.V. Radun, D.W. Jones, J.R. Rulison and C.M. Stephens, General Electric Corporate Research and Development	IM1.2	27
Concepts and Performance of Vibro Actuator —Yuji Akiyama, Kanagawa Institute of Technology, Osamu Sugiura, Yamanashi University, Koichiro Sawa, Keio University	IM1.3	40
Applications of NdFeB Magnets in Motors —Dietmar Weinmann, Aimants Ugimag, France, James H. Wise, Ugimag, Inc	IM1.4	50
2sf Beat Phenomena Found in Induction Motor —Yuji Akiyama, Kanagawa Institute of Technology, Takumi Maruoka, Tokyo Metropolitan Center of Technology and Engineering, Osamu Sugiura, Yamanashi University	IM1.5	68
DC Permanent Magnet Motor Selection Method to Maximize the Range of an Electric Powered		
-Richard Nelson, Consultant, EM Development Company	IM1.6	78
Present Status of Voice Coil Motor, Various Design Techniques and Key Performance Parameters	11.44 7	
	IIVEE.7	84
Motion System CAD/CAE		
Computer Simulation as a Guide to the Design of Six Step Motor Drives —Penn Clower, C.S. Draper Laboratories	IM2.1	107
Computer Analysis of Dynamic Stiffness and Load Invariance of DC Motor Drive Systems -Novica A. Losic, University of Wisconsin	IM2.2	118
Magnetic Analysis of Brushless DC Motors Using the Boundary Element Method —Y. Bulent Yildir, Bruce W. Klimpke and K.M. Prasad, Integrated Engineering Software Inc	IM2.3	133
Advanced Sensor Technology		
Position Measurement and Processing in High Performance Positioning Systems —Zeev Kirshenboim, Servobyte Inc	PC3.1	•
Magnetic Incremental Encoders Dr. Peter Campbell, Princeton Electro-Technology, Inc	IM3.2	143
High Resolution Position Sensor for Motion Control System —William Cumberledge, Randy Frank and Larry Hayes, Motorola Semiconductor Products Sector	IM3.3	149
CAD/CAE Software: How To Get What You Need		
Justifying Circuit Simulation Software and the Computer Platform to Run It On —C. E. Hymowitz and L.G. Meares, Intusoft	IM4.A	158
Benefits from CAD/CAE —Bill Lewis	IM4.B	162
Why You Need Reliability Prediction Software —Blair Winter, T-Cubed Systems, Inc	IM4.C	167
The Application of Circuit Simulation Software to Reduce Breadboarding Costs —Robert Gourlay, R.D.G. Engineering Inc	<b>IM4.C</b>	171

INTELLIGENT MOTION • SEPTEMBER 1991 PROCEEDINGS V

### **Semiconductors For Motor Drive & Control**

Using the MC68332 Microcontroller for AC Induction Motor Control —Jeff Baum and Ken Berringer, Motorola Inc	IM5.1	175
A Monolithic 3.4 Ampere Half Bridge Hammer Drive/Motor Drive Intelligent-Power Integrated Circuit		490
IGBT Half-Bridge Module for Motor Drives in the '90s	1110.2	107
-K. Berringer, W. Fragale and J. Takesuye, Motorola Inc.	IM5.3	206
Dan Sakols, Joe Recendes, Philips Components	IM5.4	٠
A Family of High-Voltage Integrated Circuit Drivers for Half Bridge Inverter and Switched Reluctance Motor Applications —Balu Balakrishnan, Richard A. Keller and Brooks R. Leman, Power Integrations, Inc	IM5.5	214
Single-Chip Motor Controller Features Waveform Generator Peripheral —Lee S. Davidson, Intel Corporation	IM5.6	225
Power Semiconductors		
Perspectives on 'Smart-Power' Hybrids —Paul R. Emerald, M. Timothy Hickey and Alan D. Tasker, Omnirel Corporation	IM5B.1	231
A 600V Interface IC for Three-Phase Bridge Circuits —Chris Choi, Peter Wood, International Rectifier	IM5B.2	•
Servo System Design		
A Revolutionary Concept for Adjustable-Speed Drives —Patrick Clarke, Clarke Associates	IM6.1	•
Applications for Switched Reluctance Variable Speed Drives —George H. Holling, Advanced Motion Controls Inc	IM6.2	241
Simultaneous DC Motor Selection and Control Policy Determination for Servo-Systems Scott Kimbrough, University of Utah	IM6.3	246
Versatile and Cost Effective Induction Motor Drive with Digital Three Phase Generation —Bruno Maurice, Jean Marie Bourgeois and Bernard Saby, SGS-Thomson Microelectronics	IM6.4	260
A Comparison of Steppers vs Brushless Motor Based Servo Systems —Gaston Palombo, Consultant	IM6.5	274
Control of AC Motors for Servo Applications —Dal Y. Ohm and John Mazurkiewicz, Baldor Motion Products Group	IM6.6	288
Braking Characteristics for AC Torque Motors —Hisashi Mannen, Koji Naniwa, Edison Oi, Oriental Motor Co., Ltd., Daniel B. Jones, Incremotion Associates	IM6.7	299
Displays and Mechatronics Combine to Create a Visual Motion Control System —Gordon Gibson, Densitron Corporation	IM6.8	312
Motion System Design & Applications Seminar		
Motion System Fundamentals —George H. Holling, Advance Motion Controls Inc	IM7.1	•
Integrating Technologies for Factory Automation —Bob Linden, Superior Electric	IM7.2	•
Motion Control Systems		
Digital Motion Controller Design —Curtis Wilson, Delta Tau Data Systems	IM8.1	•

#### **Motion System Integration**

Integrating Computers Programmable Controllers, and Motion — Joseph S. Pavlat and Dr. Richard P. McClellan, Pro-Log Corporation	IM9.1	314
SERCOS		
Proposed SERCOS Standard to Modernize Motion System Communications —Bob Brennan and Steve Cortese, Indramat	IM10.1	330
Fiber Optic Fundamentals and SERCOS Components		
Fiber Optic Fundamentals and SERCOS Components —Francis Wu, Hewlett-Packard	IM11.1	•
Motion System Communications		
Single-Chip DSP Motion Solution —Thomas Bucella, Thomas Battley, Teknic Inc	IM12-1	345
Centralized vs Distributed Motion Control —Curtis S. Wilson, Delta Tau Data Systems	IM12.2	350
Motion System Applications		
Experiences and Observations in Integrating a Digital Drive and a Numerical Control —Harold Morser, Cincinnati Milacron	IM13.1	364
Cutting Precision Sign Characters Using DSP Motion Control —Kevin Moore, Anagraph	IM13.2	•
Designing Low Acoustic Noise Motion Systems —George Bennett, George Gulalo, Motion Tech Trends	IM13.3	377

\*Papers not available at time of printing may or may not be available at conference.