International Conference on Industrial, Control and Instrumentation Applications of Mini and Microcomputers
San Francisco, CA
November 9-13, 1981

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Industrial Electronics & Control Instrumentation Society of the Institute of Electrical and Electronics Engineers, Inc.
TECHNICAL PROGRAM

TUESDAY

Session 1, 8:30-11:00 am, San Francisco A, AUTOMATED SYSTEM CONTROLS, Chair: R. C. Born, Ph. D., Eaton Corp.
2. Adaptive Digital Control of High-Speed Rotating Mirror Cameras, A. N. Payne, Lawrence Livermore National Labs
3. An Electronic Name Plate Prototype, H. M. Collins & J. C. Tavara; Univ. of Houston
4. Multiple Micro for Process Control and Monitoring, R. H. Leaf; Microprocessor Labs
5. Microcomputer Application to a Paper Loading Machine, J. Ishikawa; Toshiba Corp.

Session 2, 8:30-11:00 am, Golden Gate A, POWER CONVERTERS, Chair: F. Harashima, Ph. D., Univ. of Tokyo
1. Microprocessor Control of Subdivided Interval Controlled Cycloconverters, H. Ichida, H. Okamoto & A. Miyazaki; Kyoto Inst. of Tech.
2. Microcomputer-Based Symmetrical Sinusoidal Pulse Width Modulated Inverter, K. Rajasheka & J. Vithayathil; Indian Inst. of Science
3. Microprocessor Controlled Single Phase to Single Phase Cycloconverter, S. Bas & O. Kaynak, Bogazici University
5. A Flexible Controller for Current Regulated PWM Inverter, V. Stefanovic, C. Pepaionno & P. Palaniappan; Univ. of Missouri-Columbia

Session 3, 8:30-11:00 am, Golden Gate B, BIO-MEDICAL, Chair: Prof. I. Thomae; Dartmouth College
1. A Microprocessor-Based, Real Time Monitoring System for the Neurosurgical Intensive Care Unit, M. See, R. Scibas, J. Vries; Univ. of Pittsburgh
3. Dual Microprocessor System for Bio-Medical Data Acquisition and Processing, A. Maned, M. Goldberg, A. Smith, S. Stuchly; Univ. of Ottawa
4. Modelling of Wheelchair Dynamics for the Design of a Microprocessor-Based Controller, B. Johnson, J. Aylor; Univ. of Virginia
5. A Microcomputer-Based, Multi-Channel Functional Neurovascular Stimulation Unit, A. Cohen, D. Orin; The Ohio State Univ.

Session 4, 8:30-11:00 am, San Francisco A, SOFTWARE TECHNIQUES, Chair: A. Delfino, Ph.D., Software Engineering and Instruction Inc.
1. Integration of Multiple Guidance System Test into One-Guidance System Program, E. Small, C. S. Draper Lab
4. Considerations for the Design of Software for Microprocessor Systems, R. Gottleib; General Electric Company

Session 5, 2:00-4:30 pm, Golden Gate A, DATA ACQUISITION, Chair: W. E. Bennett, Ph.D; Virginia Polytechnic Inst. & State Univ.
1. Microprocessor-Based Data Acquisition System, B. Colburn; Texas A&M Univ.
2. A Microcomputer-Based Data Acquisition and Control System for an Electron Spectrometer, M. Tervonen; Technical Research Center of Finland
4. A Multiple Microcomputer Data Acquisition Subsystem for a Power Control Center, T. Hoats, R. Serafin, D. Woods; Penn. Power & Light Company
5. Measurement of Probability Density Functions Using a 16-bit Microcomputer, A. Sarkady, L. Ingenieri, R. Medley; US Naval Academy

Session 6, 2:00-4:30 pm, Golden Gate B, AUTOMATIC TESTING & INSPECTION I, Chair: T. Hasegawa; Toshiba Corporation
2. A Microcomputer Based Test System for Charge Coupled Devices, S. Sidman; Lawrence Berkeley Lab.
3. Methods of Real-Time NonData-Destructive RAM Test Systems, D. Schowengerdt, D. Lenher; Kansas State Univ.
4. Automatic Link Monitoring, S. Ginzon; Ford Aerospace and Communications Corp.
5. Self Diagnostic Capability for a Simplex Processor, S. Davison, F. Goetz, J. Tam; Bell Telephone Lab

Session 7, 9:00-Noon, San Francisco A, AUTOMATED MANUFACTURING AND NC, Chair: D. Dornfeld; UC Berkeley
1. A Microprocessor-Based NC System, Davy Li; Tsinghua Univ.
2. The Direct Data Input CNC with an Interactive CRT Display, M. Oshima & E. Ohno; Mitsubishi Electric Corp.
3. A General Purpose Microcomputer Retractable Milling Machine Controller, D. Cheng, J. Sue Chang; Sue Engineering
4. Minicomputer Control of Large Scale Order Picking System, LeRoy Bushart, Lloyd Hennessy; Engineered Systems Development Corp.
6. Computer Aids for an Electrical Manufacturing Business, V. Verheyden; General Electric Company

Session 8, 9:00-11:30 am, Golden Gate A, AUTOMOTIVE CONTROL AND DIAGNOSTICS, Chair: V. Nelson, Ph.D; Univ. of Auburn
3. A Microprocessor-Based Automatic Test Equipment for a Thyristor Chopper of an Electric Car, M. Ohara; Fuji Electric Co. Ltd.
4. Intelligent Engine Analyzer, A. Chang & D. Schweigler; FMC Corp.

Session 9, 9:00-11:30 am, Golden Gate B, POWER SYSTEMS, Chair: F. Stich; Siemens-Alis
1. Cost Savings with an Advanced Control System for Electricagenta Precipitators, G. Ben-Yaacov; Gibbs & Hill Inc.
2. Two Level Load-Frequency Control of Interconnected Power Systems, G. Aiy, Y. Abdel-Magid; Univ. of Petroleum & Minerals
3. Optimal and Noninteracted Controller for the Megawatt Frequency Control Problem, I. Abd El-Salam, I. Awad; Alexandria Univ.
4. Investigation into the Effectiveness of Digital Controllers in Power Systems, A. Aill, A. Faraq, S. Selim; Univ. of Petroleum & Minerals
5. A System Approach to Time of Use Metering, P. Johnston, R. Medlin; Westinghouse Electric

Session 10, 2:00-4:30 pm, San Francisco A, MOTOR CONTROL I, Chair: V. Stefanovic, Ph.D; General Electric Company
1. Microcomputer Controlled VSCF System, M. Nasser, M. Bishay; MTC College
2. A Microcomputer Algorithm Applied for Servomotor Control Feedback Loop System Studies, Chun Ying Yu; Bechtel Power Corp.
4. Microprocessor-Based Optimal Speed Control System of Motor Drives, F. Harashima, S. Kondo; Univ. of Tokyo
5. Microprocessor Controlled Multimotor DC Drive System, S. Palanchamy, K. Purushothaman; PSG College of Tech.

Session 11, 2:00-4:30 pm, Golden Gate A, SIGNAL PROCESSING, Chair: A. Sarkady, Ph.D; US Naval Academy
1. A Color Picture Processing System Using a 16-bit Microprocessor, Y. Okawa; Gifu University
2. Minis and Micros in Image Processing, W. Bryant; Ford Aerospace and Communications Corp.
3. A Microprocessor-Based Significant Instrument for the Analysis and Interpretation of Geophysical Data in Opencast Mining, J. Hill, R. Young, D. Gabeli; Univ. of Hull
4. Real Time Voice Encryption Using a Microcomputer, P. Veiga, J. Delgado; Instituto Superior Technico
5. Signal Processor Based Controller for Suboscillation PWM Inverters, G. Buja, P. DeNardi; Univ. di Padova
Session 12, 2:00-4:30 pm, Golden Gate B, AUTOMATIC TESTING & INSPECTION II, Chair: C. Einolf Jr., Ph.D., Westinghouse Electric Corp.
4. Personal Computer Based ROM Evaluation System for Failure Pattern Recognition, Y. S. Yang, C. Winterle, R. Ohlh; Commodore/MOS Technology Inc.

Special Vendor Session, 7:00-10:00 pm, Golden Gate A, EIGHT BIT MICROCOMPUTER FAMILIES FOR CONTROL IN THE EIGHTIES, Chair: R. C. Born, Ph.D., Eaton Corp.
AM 5200
INTEL MCS - 51
MOTOROLA 6805
NSC 800
TI 700

Session 13, 9:00-11:30 am, San Francisco A, ROBOTICS, Chair: J. C. Harshaw; Bell Telephone Labs
2. A Distributed Microprocessor Control System for an Industrial Robot, R. Rafaeli, N. Sina & J. Tlusty; McMaster University
3. Hybrid Techniques for Control of High Performance Mechanisms, C. Ringwall, L. Clark; General Electric Company
5. Distributed Computing on an Experimental Robot Control System, M. Kuo; Univ. of Wisconsin-Parkside

Session 14, 9:00-11:30 am, Golden Gate A, TRANSDUCERS, SENSORS, AND INTERFACE, Chair: J. Mallon Jr.; Kulite Semiconductor Products Inc.
1. On Integration of TM990/189 & IMSAI 8080 Microcomputer Systems, W. Lin & M. Jung; UC Davis
2. A New Transducer for Automatic Angle Measurement, T. Yu; Univ. of New South Wales
3. The Man-Machine Interface in Dedicated Computer Application, J. E. Jones; Hewlett Packard
4. An Aid for the Teaching of the Programming of Multi-Microcomputer Controlled Systems, A. Payne; Univ. of Waikato
5. A New Concept in Data Highway Technology for Control Applications, J. Leidy; AMP Inc.

Session 15, 9:00-11:30 am, Golden Gate B, ENERGY SYSTEMS, Chair: B. K. Bose, Ph.D., General Electric Company
1. Microcomputer-Based Data Acquisition and Processing System; Application in Commissioning of a Geothermal Heating Plant, A. Rothhirsch, J. Gonzalez Rubio; Instituto de Investigaciones Electricas
3. A Microcomputer-Based Approach to Control of Multi-Stage Photovoltaic Concentrator System, R. Semma, M. Imamura, Martin Marietta Corp.
4. The Application of Microprocessors to the Control of Gas Turbine Engines, E. Orhun; Middle East Technical Univ.

Session 16, 2:00-4:30 pm, San Francisco A, MOTOR CONTROL II, Chair: N. Demerdash; Virginia Polytechnic Institute & State University
2. Microprocessor-Based Optimal Efficiency Drive of Induction Machine, Prof. M. H. Park, & S. Ki; Seoul National University
3. Speed Control of DC Motor: A Low Cost System Using a Monochip Microcomputer, J. Aubry, G. Pitcher; J. Louis, A. El-Hefnawy; Univ. de Nancy
4. Analog Microprocessor-Based Speed Controller, V. Jaswa, T. Zaloum; General Electric Company
5. Design and Implementation of a Fully Digital DC Servo System Based on a Single Chip Microcomputer, P. Tang, Y. Wu; National Chiao Tung Univ.; S. Lu; National Taiwan Univ.

Session 17, 2:00-4:30 pm, Golden Gate B, PROCESS CONTROL, Chair: B. Colburn, Ph.D., Texas A&M University
1. Pattern Generators for Hybrid IC'S, G. Kimoto, K. Morimoto, K. Miyazaki, K. Nakamura; Nippon Electric Company
2. Microcomputer Software Design Techniques for Industrial Logic Controller Using Mixed Events, O. Yeresoy; Univ. Libre de Bruxelles
3. Applications of Microcomputers to Multi-Variable Control Systems, C. Herglotz; Lawrence Livermore National Lab

Session 18, 2:00-4:30 pm, Golden Gate B, MACHINE VISION, Chair: A. Goksel, Ph.D.; Bell Telephone Lab
1. An Automatic Picture Adjusting System for Color Picture Tube, T. Kawaguchi; Hitachi Ltd.
2. Microcomputer Controlled Potato Sizing and Selecting Machinery, P. McCrea; Univ. of Essex
3. Silhouette Area and Centroid Measurement Using a C/D Camera and an 8086 Microcomputer, D. Capson, R. Kitai; McMaster Univ.
4. Optimization (TM) II - Microprocessor-Based Vision Processing Instrumentation for Automatic Inspection, J. Lunden; General Electric Company

TUTORIAL I—MONDAY

TUTORIAL II—FRIDAY

For Whom Intended:
The course is structured at the undergraduate level for engineers, scientists and other technical people having a basic understanding of electronics and some knowledge of micro or mini computers.

Course Objective:
This course will provide you with a foundation for understanding the characteristics of data acquisition system components and will aid in selecting instrumentation from the current hardware offerings.

Course Outline:
- Basic Data Acquisition-System Concepts
- Digital I/O (Digital Input, Digital Output, Timers, Counters)
- Analog Input (A/D Converters)
- Microprocessor Interface and I/O Control Techniques (Program-Controlled I/O, Interrupts, DMA)
- Standard Buses

Call Prof. Jaeger at 205/826-4330 for further information

For Whom Intended:
Scientists and Engineers with some knowledge of digital electronics who want to use microprocessors to control physical processes and devices.

Course Objective:
To illustrate the use of contemporary digital hardware, software, and algorithms which transform microprocessor components into intelligent control systems.

Course Outline:
- hardware vs. software control
- microcomputer organization
- input/output control
- data acquisition
- process control algorithms
- design aids
- micro vs. minicomputer
- application examples

Call Prof. Weaver at 804/924-7201 for further information
Conference Registration 7-9 p.m. Sunday and starting 8 a.m. each morning except 7:30 a.m. Tuesday.

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IECI '81 November 9-13, 1981
MAIL TO: Registrations Dept.
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Name ____________________________
(First) ____________________________
(Last) ____________________________
Title ____________________________
Name(s) of Additional Person(s) Sharing Room:
Mailing Address ____________________________
(Company Name) ____________________________
(Street Address) ____________________________
(City) ____________________________ (State) ____________________________ (Zip) ___________

NOTE: Your room reservation will only be held with a guarantee by credit card or one night's minimum deposit of $100.00.

Credit Card # ____________ Exp. Date ____________


(Please Check Appropriate Box)

- [ ] Advance Registration
- [ ] Late Registration
- [ ] October 31, 1981
- [ ] At Door

☐ IEEE Member $80 $90
☐ Non-Member $95 $110
☐ Student $50 $50

Amount Enclosed: $________ Checks must be in US dollars.

No credit cards or purchase orders accepted.

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- [ ] Tutorial 1. Monday Nov. 9, 1981
- [ ] Data Acquisition System Technology
- [ ] Tutorial 2. Friday Nov. 13, 1981
- [ ] Microprocessor Applications to Industrial Process Control
- [ ] Tutorial 1 and 2.

Amount Enclosed: $________ Checks must be in US dollars.

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Registration by Oct. 31 will guarantee tutorial materials during attendance. Coffee break refreshments included.

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SCHEDULE OF RATES

<table>
<thead>
<tr>
<th>Rate</th>
<th>Single</th>
<th>Double</th>
<th>Suites</th>
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<tr>
<td>Std.</td>
<td>$85</td>
<td>$105</td>
<td>$225</td>
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<td>Sup.</td>
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<td>Dlx.</td>
<td>$105</td>
<td>$125</td>
<td>$275</td>
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Additional person with existing bedding $20.
Rollaway—additional charge of $10.

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☐ Bedroom Suite $________

DATE OF ARRIVAL ____________________________
DAY OF ARRIVAL ____________________________
DATE OF DEPARTURE ____________________________
DAY OF DEPARTURE ____________________________

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CHECK IN TIME 3:00 PM/CHECK OUT TIME 12:00 Noon