The North American Manufacturing Research Institution of the Society of Manufacturing Engineers invites you to attend the Twenty-Eighth North American Manufacturing Research Conference NAMRC XXVIII May 23-26, 2000 Lexington, Kentucky

hosted by

CENTER for ROBOTICS and MANUFACTURING SYSTEMS
College of Engineering

Sponsored by the North American Manufacturing Research Institution of the Society of Manufacturing Engineers
Dear Colleagues and Friends,

We would like the opportunity to provide you with a good old southern welcome to the Bluegrass Region of the Commonwealth of Kentucky. The Center for Roborics and Manufacturing Systems and the Department of Mechanical Engineering in the College of Engineering at the University of Kentucky in Lexington, KY, are pleased to host the 7th North American Manufacturing Research Conference (NAMRC) on May 23-25.

Despite its regional venue, this conference has evolved as a major international forum for the dissemination and discussion of research results in the field of manufacturing science and technology. It provides a unique forum for academic and industrial-based researchers to exchange and discuss in-progress, or newly completed, research applicable to manufacturing technology and productivity.

This year, 75 technical papers will be presented at the conference by researchers from universities, research institutes, and industrial research laboratories located around the world. All of these complete manuscripts have been accepted for presentation at and publication in the Transactions of the conference based upon a stringent peer review process conducted by the Scientific Committee of the North American Manufacturing Research Institute of the Society of Manufacturing Engineers (NAMRI/SME).

The conference will begin in the early evening of Tuesday, May 22, with a welcoming reception at the Radisson Plaza Hotel situated in downtown Lexington. On Wednesday, May 23, the conference Opening Ceremony will feature a keynote address by the founder and president of DataBeam Corporation, Dr. Lee Todd, who will discuss the relationship between entrepreneurship, high technology companies, research and academia. The conference banquet will be held at the Kentucky Horse Park, the world's premiere equestrian and show facility. An accompanying guest program will also be available and is designed to provide a flavor of the Kentucky Bluegrass Region, the international capital of the thoroughbred racehorse. In fact, there is so much of interest in the Bluegrass Region, you may want to consider bringing the whole family and spending the long weekend exploring its attractions.

Every year, this conference attracts over 200 manufacturing research engineers and scientists, research and development managers, production engineers and managers, design specialists, outreach professionals, manufacturing managers, research professors, graduate students, research assistants, manufacturing educators, and industry representatives from around the world. It provides not only an excellent forum for information transfer, but also a first-rate opportunity for informal discussion and networking.

We look forward to renewing acquaintances with those of you who are regular attendees at this conference, and to meeting many of you who will be attending for the first time. We believe that participation in NAMRC XXVIII will be both an intriguing and beneficial experience for you.

Cordially,

Alan T. Male, Chair
1. S. Jawahir, Co-Chair
Keith Rouch, Co-Chair
NAMRC XXVIII Organizing Committee
# NAMRC XXVIII Program at a Glance

**Hosted by the University of Kentucky • Lexington, Kentucky, USA**

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<td>Registration &amp; Breakfast</td>
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<td>Welcoming Ceremony</td>
<td>WorkShop/Thursday UK Student Center</td>
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Department of Mechanical Engineering, University of Kentucky

R. Watton
College of Engineering Administration and the Department of Electrical Engineering, University of Kentucky

ADDITIONAL ASSISTANCE FROM THE UK STUDENT CHAPTER
Conference Site

The University of Kentucky (UK) is the flagship institution of higher education for the Commonwealth of Kentucky. UK has long recognized the pivotal role it plays in the life of the Commonwealth - a role that brings intellectual prosperity to Kentucky's citizens, to America and to the world at large. UK is designated a Research I University by the Carnegie Foundation, one of only 59 public universities in the country and the only one in Kentucky.

The Center for Robotics and Manufacturing Systems (CRMS), a unit within the College of Engineering, became fully operational in 1990. The 60,000 square foot facility is home to the administrative offices, laboratories and programs of the CRMS, the office of the dean of engineering, and the department of mechanical engineering.

Laboratories located in the facility support the research focus areas of system controls, laser prototyping, welding research and development, machining, CAD/CAE, materials joining, nontraditional processing, metal working, finite element analysis, robotics and painting technology. The facility also houses a networking laboratory jointly operated by the department of computer science and the technology commercialization center.

The center is home to manufacturing research, technical assistance and education programs designed to help industry maintain a competitive edge in today's markets. Center researchers and staff work closely with industry to develop and improve processes for the manufacture of new materials, modeling and simulation, and automation and system integration.

The CRMS facility also contains instructional television classrooms and satellite uplink and downlink equipment used to broadcast distance learning courses throughout the Commonwealth and the world.

Facilities

Various sites and facilities have been chosen for NAMRC XXVIII. The Radisson Plaza Lexington will be the host hotel and the site for the Tuesday Evening Registration and Welcoming Reception. All conference technical sessions will be held in the University of Kentucky Student Center located on campus and special events will be held at the Kentucky Horse Park and Spindletop Hall.

Special Presentations

The winners of the 1999 Machining Technology Association of SME (MTA/SME) Best Paper Awards will present their papers at NAMRC XXVIII. The awards were presented at the 3rd International Machining & Grinding Conference.

Special Activities

NAMRC begins with the Welcoming Reception Tuesday, May 23 at the Radisson Plaza Lexington. The hotel is located at 369 West Vine Street in downtown Lexington. The phone number is (606) 231-9000.

Wednesday, May 24 takes the attendees to the Kentucky Horse Park, which is dedicated to man's relationship with the horse. The Kentucky Horse Park is unlike any other park in the world - a showcase of museums, galleries, theaters, and working farm exhibits. More than 45 breeds of horses grace upon its lush pastures. Participants will enjoy a casual evening of dinner, entertainment by area cloggers/square dancers, hayrides and tours of the grounds of this beautiful theme park.

Thursday evening, May 25, a wine and cheese reception will be held at the University of Kentucky's faculty/staff/alumni club, Spindletop Hall. Built in 1935, the club facility includes an elegant mansion with over 85,000 square feet of floor space. The grounds include ten tennis courts, four swimming pools and a bathhouse, snack barn, picnic area, jogging/walking trails and a playground.

Other special activities include a COMEC meeting on Tuesday, May 23 from 1.00 - 5.30 p.m. in the Lincoln Room at the Radisson Plaza Hotel; the annual NAMBC/SME membership meeting on Thursday, May 25 from 3:30 - 4:30 p.m. in the UK Student Center; and the ASME-MED meeting on Thursday, May 25 from 4:30 - 5:30 p.m. in the UK Student Center.

Laboratory Tours: Thursday, May 25, from 3:30 - 5:00 p.m.

The tours will highlight laboratories in the facilities of the Center for Robotics and Manufacturing Sciences. The following is a list of available tour sites and tour hosts:

CRMS Manufacturing Research Laboratories
- Electronics Manufacturing Laboratory, Jerry Tackett
- Laser Diagnostics for Thermal Fluid Systems, Professor Kousha Asadi
- Dr. Mohammad I. Hasan
- Laser Processing Laboratory, Professor Janet Lapp
- Machining Research Laboratory, Professor L.L. Jawahir
- Rapid Prototyping Laboratory, R.J. Robinson
- Welding Research Laboratory, Professor YuMing Zhang

You may also want to take a tour of the University of Kentucky campus on your own. Maps outlining a self-guided walking tour are available at the visitor's center located on the first floor of the student center near the University Book Store.

Special Tour

Toyota Motor Manufacturing, Kentucky, Inc. opened in 1988, and is the first in North America to build minivans and passenger cars on the same production line. A pre-concert tour of the facility has been scheduled for the afternoon of Tuesday, May 23, 2000. Visitors will board trains to view the automobile assembly plant. Space is extremely limited and will be reserved for the first 27 attendees who register for the tour. Please check Web site for availability. Advance registrations only.

* The (800) area code is scheduled to change to (859) effective April 1, 2000.
Guest Program
Shaker Village of Pleasant Hill, Wednesday, May 24
Enjoy a tour of nearby Shaker Village of Pleasant Hill, the nation’s largest restored Shaker Village community where you will be able to see demonstrations by spinners, weavers, broommakers and others. Lunch will be served Shaker-style in the Trustees House and there will be ample time to explore the original 19th century buildings. You will be back at the Radisson in time to board the buses for the Kentucky Horse Park for the evening banquet.

Kentucky Horse Park, Wednesday, May 24
The Kentucky Horse Park will be home to the World Premiere of Imperial China: The Art of the Horse in Chinese History during NAMRC. This exhibit will feature more than 100 artifacts, many of which have never before been allowed to leave China, and will cover more than 2,000 years of Chinese history. Your ticket is included in the registration fee.

Horse Farm Country, Thursday, May 25
Thursday, a visit to Horse Farm Country and historic downtown will give you a behind-the-scenes look at the multiplicity of dollar thoroughbred industry. A short ride through the beautiful Bluegrass countryside will take you to the Irish Acres with over 30,000 square feet of antiques from all over the world. Lunch will be served at the Glitz, an eclectic restaurant at Irish Acres. During the afternoon, you will go to Lamber and Graham Distillery where you will be introduced to the history of bourbon made by the pot still method.

Additional Information
Vegetarian salads will be provided at each meal for those who request them. Please indicate your dietary requirements on the registration forms. Also, those who require accommodations for disabilities should inform the University of Kentucky through the registration form.

Registration Fees
Registration fees can be paid by check, money order, purchase order or credit card in U.S. dollars only. Complete one form per person. Make additional copies as needed.
Registration for the full conference is $395.00 (U.S. Funds) for registrations postmarked or received before May 3, 2000. After that date registration will be $400.00. The student/retiree registration is $120.00 and the guest registration fee is $135.00. All fees except the guest registration include all NAMRC meals and conference publications. Included in the guest registration fees are conference breakfasts, the conference banquet, two receptions, and tours of the Bluegrass Region on Wednesday and Thursday (see Giant Program). There are no reduced registration fees for authors or session chairs. There are no single-day registrations.

Cancellation and Refunds
Cancellations made ten (10) working days or less before the conference are subject to a cancellation service charge of $100.00. The conference registration may be transferred to another colleague without charge.
To be eligible for any refund of fees, less a $100.00 administrative fee, please notify us in writing (fax or email) by May 10, 2000. Unfortunately we cannot offer refunds after that date. Please note that “no shows” do not receive refunds and are responsible for the entire fee. Refunds are processed immediately following the conference. Please allow six to eight weeks to receive the refund.

Travel
Lexington, Kentucky is located at the major junction of interstates 75 and 64. The Blue Grass Airport is just 10 minutes from downtown, with Northern Kentucky-Cincinnati International Airport, just 83 miles away via I-75. The University of Kentucky campus is only 15 minutes from Lexington’s Bluegrass Airport and 90 minutes from Louisville and Cincinnati.

Visa & Health Insurance
All international participants are requested to make arrangements for their U.S. Visa and health insurance.

Lodging
The Radisson Plaza Lexington is the primary lodging site for the conference. It is located in the heart of downtown Lexington and is about a mile from the University of Kentucky campus and ten minutes from the Lexington Bluegrass Airport. The group rate is $109.00 per night single/double/triple/quad.

IMPORTANT NOTICE - Reservations at the Radisson Plaza Lexington must be made by April 23, 2000 to receive the conference rate of $109.00 per night single/double/triple/quad. Phone (606)253-1100* or fax (606)281-3704* to make your reservations.

The Radisson offers an indoor pool, jacuzzi, sauna, exercise rooms, free airport shuttle service, free self-parking in an enclosed garage, valet parking, restaurant, cocktail lounge, entertainment, gift shop and wheelchair accessible rooms. Other hotels in the vicinity include:

- **Holiday Inn North - Holdomoe Indoor Recreation Center**
  - 1950 Newtown Pike
  - Lexington, KY 40511
  - (606) 213-0512 or (800) HOLIDAY
  - FAX (606) 253-1105*

- **Campbell House Inn, Suites & Golf Club**
  - 1375 Harrodsburg Road
  - Lexington, KY 40504
  - (606) 253-3281*
  - In State (800) 432-9254
  - Out of State (800) 354-9235
  - FAX: (606) 254-4568*

- **Greenleaf Inn**
  - 2280 Nicholasville Road
  - Lexington, KY 40503
  - (606) 277-1194*

- **Greenside Inn**
  - 2280 Nicholasville Road
  - Lexington, KY 40503
  - (606) 277-1194*

- **The Springs Inn**
  - 2020 Harrodsburg Road
  - Lexington, KY 40503
  - (606) 277-5751*
  - (800) 354-9583
  - FAX: (606) 277-3142*

* The (606) area code is scheduled to change to (859) effective April 1, 2000.
Parking
On-campus parking is very limited and driving to conference sessions is discouraged. The Radisson Plaza Lexington offers parking and is about a mile from campus. Limited bus transportation will be offered to and from the hotel to campus.

Climate
The average temperature in May is 65 degrees Fahrenheit, however spring temperatures may range anywhere between 34-74 degrees Fahrenheit.

Time Zone
October to April: Eastern Standard Time
April to October: Daylight Savings Time

To Register
Mail:
Complete the registration form at the back of this brochure and mail it with your payment using check, money order, purchase order, or charge card number to:

Jutta Gravas, Conference Manager
Center for Robotics and Manufacturing Systems
220 B CRMS Building
UK College of Engineering
Lexington, KY 40506-0108

Fax:
To register by fax please complete the form, include your credit card number or your purchase order number and fax to (606) 323-1015.* This line is available 24 hours a day.

E-mail:
E-mail your registration to: jgravas@engr.uky.edu.

On-line:
Visit www.sme.org/namrc and link to the NAMRC XXVIII information. Please fill out the form, print and transmit by one of the above methods. The site is NOT a secure site for transmitting credit card numbers.

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NAMRC XXVIII Technical Sessions and Programs
Tuesday, May 23, 2000

1:00 - 3:00 p.m.
Tour of Toyota Motor Manufacturing Kentucky, Inc. (Space is limited. Check Web site at www.sme.org/namrc for availability)

1:00 - 5:30 p.m.
COMEC Meeting
Lincoln Room, Radisson Plaza Hotel

5:00 - 9:00 p.m.
Conference Registration and Welcoming Reception
The Radisson Plaza Hotel, Downtown Lexington, Kentucky

Wednesday, May 24, 2000

7:30 - 8:30 a.m.
Registration and Continental Breakfast
University of Kentucky, Student Center Complex

8:30 - 10:00 a.m.
Welcoming Ceremony
Worsham Theater, University of Kentucky, Student Center Complex

Opening Remarks:
Alan T. Male, Chair NAMRC XXVIII

Welcoming Remarks:
Cho-Hung Shen, President, NAMRI/SME
Elisabeth Zirosky, Chancellor, University of Kentucky Lexington Campus
Thomas W. Lester, Dean, University of Kentucky College of Engineering

Keynote Address:
Lee Todd, Founder and President, DataBeam, Lexington, Kentucky

10:00 - 10:30 a.m.
Refreshment Break

10:30-12:00 noon
Concurrent Technical Sessions

Session 1-A: Forging

Co-Chairs: Rajiv Shrivastava, The Ohio State University
Alvin Sabloff, Metal Working Consultants

Forging Preform Design Using Element Power Minimization
by R.J. Heimann, Jr. and J.L. Frater, Cleveland State University
Finite Element Simulation of Orbital Forging of Large Disk with Rocking Die Using Anis-Symmetric Approximation by K.-L. Moi, Toyoashi University of Technology; O. Ebihara, Topy Industries, Ltd.

Optional Condition for Embossing Process of Electron Gun Part by E.S. Lee, Navistar International Transportation Corporation, K.I. Kim, Samsung Display Devices; K. Kim, Northern Illinois University

Session 1-B: Material Removal I
- Friction and Material Behavior

Co-Chairs: Abdel E. Bayoumi, University of South Carolina
           Pankaj K. Mehrotra, Kennametal, Inc.

Material Behavior of Aluminum 7075 and AISI 1045 Steel in High Speed Machining by S. Siems, R. Dollmeier and G. Warnecke, University of Kaiserslautern

Characterization of Friction in Machining: Evaluation of Asperity Deformation and Seizure-Based Models by S. Bhattacharya, University of Kentucky and M.R. Lovell, University of Pittsburgh

The Influence of Thin Hard Coatings on Friction in the Orthogonal Cutting Process by W. Graesak and P. Nieslony, Technical University of Opole

Session 1-C: Manufacturing Systems I
- Process Planning

Co-Chairs: Hoda ElMaraghly, University of Windsor
           Thomas Kurten, Georgia Institute of Technology

Decision Making in a Multi-Constraint Agent-Based Process Planning System by P.K. Wright, D.A. Durnfeld, F-C. Wang and C-H. Chu, University of California at Berkeley

Managing Machine Tool Information: The Path from Standardization to Implementation by M.G. Montero, University of California at Berkeley; P.M. Forrester, University of Illinois at Urbana-Champaign; J.G. Karter, Jr., Caterpillar, Inc.

Geometric Tolerance Normalization and Its Application by Q. Liu and S. H. Huang, University of Toledo

12:00 Noon - 1:30 p.m.
Luncheon and Founders Lecture
Grand Ballroom, UK Student Center
Presiding: Chi-Hung Shen, NAMRI/SME President
Presentation by: Tylan Alten, The Ohio State University

1:30 p.m. - 3:00 p.m.
Concurrent Technical Sessions

Session 2-A: Forming II - Sheet Metal

Co-Chairs: Don A. Luck, Oklahoma State University
           James C. Malas, Air Force Research Laboratory

Open-Loop Optimization of the Sheet Metal Drawing Process with Active Drawbeads by M.L. Bohn, Pratt Corporation Technical Center; K.J. Weimann, Michigan Technological University

Influence of Temperature and Strain Rate on Plastic Instability during Deep Drawing by E. Zussmann, Technion-Israel Institute of Technology

An Experimental Investigation of Curved Surface-Strait Edge Hemming by G. Zhong, H. Yao, X. Wu and S.J. Ha, University of Michigan; K. Harper and W. Faitel, Lamb Technicon Body Assembly Systems

Session 2-B: Material Removal II
- High Speed Machining

Co-Chairs: Günther Warnecke, University of Kaiserslautern
           Matthew A. Davies, National Institute of Standards and Technology

Comparison of Sialon and Silicon Carbide Whisker Reinforced Alumina Ceramic for High-Speed Milling of Inconel 718™ by R. M. Arunachalam and M.A. Mannan, National University of Singapore

Effects of Cutter Orientation When Ball Nose End Milling Inconel 718™ by E-G. Ng, R.C. Dewes, and D.K. Aspinwall, University of Birmingham; D-W. Lee, Pusan National University

1999 MTA/SME Best Paper Award Winner

High Speed Machining of Unsupported Thin-Walled Structures by E. Agba, J.T. Berry and D. Isher, Mississippi State University
Session 2-C: Manufacturing Systems II - Burr Control in Drilling, AE Sensors in Milling

Co-Chairs: Elijah Kentsay-Asih, Jr., University of Michigan
           Sivasankar Raman, University of Oklahoma

- Development of a Drilling Burr Control Chart for Stainless Steel
  by J. Kim and D.A. Dornfeld, University of California at Berkeley

- Basic Study on Development of Sensor to Detect Cutting Force Components
  Based on Villari Effect
  by H. Aoyama, A. Amemiya and I. Inasaki, Keio University;
  H. Ohno, Mitsubishi Materials Corporation

- Progressive Tool Wear Monitoring in Milling Operations Based on Frequency Analysis of Acoustic Emission Root Mean Square
  by A.K.T. Chung and A. Geddam, City University of Hong Kong

3:00 - 3:30 p.m.
Refreshment Break

3:30 - 5:00 p.m.
Concurrent Technical Sessions

Session 3-A: Forming III - Sheet Metal II

Co-Chairs: Klaus J. Weizmann, Michigan Technological University
           Amit Bagchi, MTD Products, Inc.

- Covev Laser Forming with High Certainty
  by W. Li and Y. L. Yao, Columbia University

- Modeling and Control of Plasma-Jet Forming Process
  by A.T. Male, Y.W. Chen, P.J. Li and Y.M. Zhang, University of Kentucky

- Analysis and Design of Hydroforming Processes by the Rigid-Plastic Finite Element Method
  by B-S. Kang, L-P. Lei and D-H. Kim, Pusan National University

Session 3-B: Material Removal III - Predictive Models for Machining

Co-Chairs: Robin Stevenson, General Motors
           Joseph A. Arseculeratte, University of New South Wales

- A Predictive Model for Temperature Distributions in 'Classical' Orthogonal Cutting
  by C.B. Alawihare, F.J.A. Armarego and A.J.R. Smith, The University of Melbourne

- Prediction and Validation of Chip Up-Curl in Machining Using the Universal Slip-Line Model
  by N. Fang and L.S. Jawahir, University of Kentucky

  by A.J. Bergstrom, J.W. Sutherland, A.J. Filipovic and W.W. Olson, Michigan Technological University

Session 3-C: Manufacturing Systems III - CMMs, Datums, Reverse Engineering

Co-Chairs: Kornel F. Ehmao, Northwestern University
           Shreys N. Melkote, Georgia Institute of Technology

- A Complete and Efficient Algorithm that Identifies all Valid Planar Datums
  by S. Bapat, Structural Dynamics Research Corporation; R.G. Wilhelm, University of North Carolina at Charlotte

- Accessibility and Measurement Clustering for CMM Inspection
  by A. Vafiopoulos, H.A. ELMaraghy, University of Windsor

- Reduction in Number of Data Collected for Reverse Engineering of Free-Form Surfaces
  by K.K. Krishnan, P.P. Chowdhury, B. Bahr and Y.K. Wong, Wichita State University

6:00-10:00 p.m.
Old Kentucky Night
Kentucky Horse Park
(Transportation provided, dress - casual)
Thursday, May 25, 2000

7:30 - 8:30 a.m.
Registration and Continental Breakfast

8:30 - 10:00 a.m.
Concurrent Technical Sessions

Session 4-A: Forming IV - Rolling and Extrusion
Co-Chairs: Oscar W. Dillon, University of Kentucky
Chia-Hung Shen, General Motors Technical Center

Process Optimal Design in Metal Forming by Double-Objective Genetic Algorithm by J.S. Chang, Research Institute of Industrial Science and Technology;
S.M. Byon, H.J. Kim and S.M. Hwang, Pohang University of Science and Technology

Prediction of Ductile Fracture in Forward Extrusion with Spherical Dies by J. Hoffmann, Diebold Systomer; C. Santiago-Vega, GF Medical Systems; V.H. Vinquet and T. Altan, The Ohio State University

Investigation of a Double Reduction Die for Reduced End Cracking During Cold Extrusion by A. Pulalkar, S. Kini and R. Sivaprakasam, The Ohio State University

Session 4-B: Material Removal IV - Cutting Fluids
Co-Chairs: John Sutherland, Michigan Technological University
Shane Y. Hong, Columbia University

Environmentally-Conscious Minimum Quantity Lubrication (MQL) for Internal Cylindrical Grinding by D. Hafnerbradl and S. Majkin, University of Massachusetts

Cutting Fluid Aerosol Generation in Turning Operation by Z. Chen, A. Amradi, S.Y. Liang, Georgia Institute of Technology; D.A. Stephenson, General Motors Corporation

Tool Life When Turning Gamma Titanium Aluminide Using Carbide and PCD Tool with Reduced Depths of Cut and High Pressure Cutting Fluid by A.C. Sharman, D.K. Aspinwall, R.C. Dewes and P. Bowen, University of Birmingham

Session 4-C: Manufacturing Systems IV - Cell Design, Plant Layout
Co-Chairs: Robert G. Wilhelm, University of North Carolina at Charlotte
Yuan-Shin Lee, North Carolina State University

Cell Design for Lean Manufacturing by J.T. Black, Auburn University

Mass vs. Lean Plant Design Evaluation Using the Production System Design Decomposition by D.S. Cochran and D.C. Dolle, Massachusetts Institute of Technology

A Pattern Recognition Approach for Facility Compaction and Selection of Flexible Automation by S.A. Irani and H. Huang, The Ohio State University

10:00 - 10:30 a.m.
Refreshment Break

10:30 - 12:00 noon
Concurrent Technical Sessions

Session 5-A: Forming V - Friction and Bar/Rod Drawing
Co-Chairs: Alan T. Male, University of Kentucky
Taylan Altan, The Ohio State University

Intermediate Die Design System for the Multi-Stage Drawing Process by Y-C. Kim, D-J. Kim and B-M. Kim, Pusan National University

Skin Pass Wire Drawing of Stainless Steel with Chloration-Free Lubricant with the Aid of Ultrasonic Vibration by M. Murakawa, P. Kaeuwstip and M. Jin, Nippon Institute of Technology

Friction in Compression Testing by J. Jeswiet, P. Wild and T. Moore, Queen's University
Session 5-B: Material Removal V - FE Modeling
Co-Chairs: Richard Liu, Purdue University
Runajo Ghosh, Kennametal, Inc.
Mechanically and Thermally Coupled Finite Element Analysis of Chip Formation in Metal Cutting by J-D. Oh and G. Warneke, University of Kaiserslautern
Tool–Workpiece Interface in Orthogonal Cutting - Application of FEM Modeling by M. Shatla, Y-C. Yen and T. Altan, The Ohio State University
Residual Stress Formation Mechanism and its Control by Sequential Cams by Y-B. Guo and C-R. Liu, Purdue University

Session 5-C: Manufacturing Systems V - Sculptured Surfaces and Measurement
Co-Chairs: Radovan Kovačević, Southern Methodist University
Steven Liang, Georgia Institute of Technology
Sculptured Surface Localization Using Generalized Hopfield Networks by R. Gotlib, S. Amund and B. Rothari, University of Cincinnati
NC Tool Path Planning for Sculptured Surface Machining Based on Constant Scallop Height by H-Y. Feng and H. Li, The University of Western Ontario
A New Area-Based Stereo Algorithm for Measurement of 3D Shapes by G-B. and S-C. Chung, Hanyang University

Session 6-A: Forming VI - Casting, Welding and Polymers
Co-Chairs: Yan Ming Zhang, University of Kentucky
Michael Lovell, University of Pittsburgh
Integration of Process Modeling and Design of Experiments for Improving the Pouring Phase of the Die Casting Process by V. Sankararaman, S. Kanna and R. Shivpuri, The Ohio State University
Modeling of Welding Arc Light Radiation by P.J. Li and Y.M. Zhang, University of Kentucky

Session 6-B: Material Removal VI - Performance Evaluation
Co-Chairs: Jun Ni, University of Michigan
Walter W. Olson, University of Toledo
The Frequency Content of Turned Surface Profiles by K-N. Kim and K-P. Ehmann, Northwestern University
A Study of Apparent Negative Rack Angle and Its Effect on Shear Angle during Orthogonal Cutting with Edge-Radiused Tools by J. Manjunathaiah, Lamb Technicon Machining Systems; and W.J. Endres, University of Michigan

Session 6-C: Manufacturing Systems VI - Agile Manufacturing, Enterprise System
Co-Chairs: Ming C. Leu, University of Missouri-Rolla
Shonak Athavale, Ford Motor Company
Agility Within a Manufacturing Industry - A Case Study at ABB Robotics by M. Jackson, ABB Management Consultants AB; and C. Johansson, Linköpings Universitet
A Quality Forecasting System for Glass Melting Processes using Genetic Algorithms by B. Jeong and H. Jung, Yonsei University
Session 6-D: Material Removal/Manufacturing Systems I - Fixtures
Co-Chairs: Yang C. Shin, Purdue University
Stephen A. Ratzer, University of Arkansas - Little Rock

On the Prediction of Friction Force at Workpiece-Fixture Interface by B. Fang, R.E. DeVor and S.G. Kapoor, University of Illinois at Urbana-Champaign

A Minimum Clamping Force Algorithm for Machining Fixtures by B. Li and S.N. Melkote, Georgia Institute of Technology

An Experimental Investigation into the Deflection of a Fixture-Workpiece System by Y.G. Liao and R. Stevenson, General Motors Corporation; R. Khattan, Delphi Automotive Systems

3:00 - 3:30 p.m.
Refreshment Break

3:30 - 4:30 p.m.
√ NAMRI/SME Member Meeting

4:30- 5:30 p.m.
ASME MED Meeting

3:30-5:00 p.m.
Concurrent Laboratory Tours
University of Kentucky Campus (Self guided)

5:00 - 6:00 p.m.
Special Session on Assessment of Machining Models
Moderators: Matthew A. Davies, National Institute on Standards and Technology
Robin Stevenson, General Motors Corporation
Shonul Athavale, Ford Motor Company

Note: all above afternoon events will be held at the UK Student Center

6:00-9:30 p.m.
√ Wine & Cheese Reception
University of Kentucky-Spindletop Hall
Faculty/staff/alumni club

Transportation to and from the reception will be provided. Buses will depart from the Radisson Plaza Hotel at 7:45 p.m. and again at 6:30 p.m.

Friday, May 26, 2000
7:30 - 8:30 a.m.
Registration and Continental Breakfast
8:30 - 10:00 a.m.
Concurrent Technical Sessions

Session 7-A: Material Removal VII - Tool Wear and Surface Quality
Co-Chairs: Edward J. A. Armarego, University of Melbourne
Christopher A. Brown, Worcester Polytechnic Institute

An Investigation of Tool Wear and Surface Quality in Hard Turning by T.G. Dawson and T.R. Kurfess, Georgia Institute of Technology

Effect of Process Parameters Upon Tool Wear of Ball-Nose End Mills by C.A. Rodriguez, Instituto Tecnologico y de Estudios Superiores de Monterrey; T. Aitan, The Ohio State University

A Study of the Effect of Process Parameters on Surface Finish of Drilled Holes by D. Ramaswamy, A. Tucker, A. Olmez, S. Chandrasekar and W.D. Campion, Purdue University

Session 7-B: Material Removal VIII - Electro-processes
Co-Chairs: Robert E. Williams, University of Nebraska
Ryan Vallance, University of Kentucky

Generation of Complex Micro Cavities by Micro EDM by Z. Yu and K.P. Rajurkar, University of Nebraska-Lincoln

Influence of Electrode Materials and Polarities on the Electrode Erosion Rates in EDM Process by R. Saha, Tata Consultancy Service; R. Kumar and M.K. Mojs, Indian Institute of Technology

Session 7-C: Manufacturing Systems VII • Controls
Co-Chairs: Michael F. Finn, Institute of Advanced Manufacturing Sciences, Inc.
(IAMS®)
Scott Stephens, University of Kentucky
Auto-Tuning Adaptive Supervisor Control of Single-Plane Active Balancing Systems by S.W. Dyer and Z. Zhuang, BalaDyne Corporation; J. Ni and J. Shi, University of Michigan
Supervisory Adaptive Balancing of Rigid Rotors During Acceleration by S. Zhou and J. Shi, University of Michigan
Cutting Tool Identification System for Accident-free Machining by J. Liu, K. Yamauchi and T. Koide, University of California at Davis
10:00 - 10:30 a.m.
Refreshment Break
10:30 a.m. - 12:00 noon
Concurrent Sessions

Session 8-A: Material Removal IX • Sensors
Co-Chairs: Mohammad A. Maman, National University of Singapore
Haim A. El-Moselhy, Indiana University-Purdue University Indianapolis
A New Approach for the Detection of Worn Tool Status by M. Murugan and V. Radhakrishnan, Indian Institute of Technology
Analysis of Sound Signal Characteristics Associated with Adhesive Wear in Machining by M.C. Lu and E. Kamat-Ashby, Jr., University of Michigan
Application of New-Acoustic Emission Monitoring Technique to Nontraditional Machining by R.E. Williams, E.L. Clark, O.M. Kinyungu, S. Sarikaya and K.P. Rajkumar, University of Nebraska-Lincoln

Session 8-B: Material Removal X • Microshape and High Speed Grinding
Co-Chairs: Ioan Marinescu, University of Toledo
Guangming Zhang, University of Maryland
Fabrication of Micro Shapes of Advanced Materials by ELID-Grinding by J. Qian, H. Olmert and T. Kato, The Institute of Physical and Chemical Research, I. Marinescu, University of Toledo
1999 MTA/SME Best Paper Award Winner
Innovative Approach of Electrolytic In-Process Dressing for High-Speed Grinding by X. Liu and Z. Zhu, Stevens Institute of Technology
Development of a Quartz Dissolution Model for Vitrified Grinding Wheel Bonding Systems by M.J. Jackson and B. Mills, University of Liverpool

Session 8-C: Material Removal/Manufacturing Systems II • Thermal Modelling, Thermal and Surface Integrity
Co-Chairs: Y. Lawrence Yao, Columbia University
Ardi Srivastava, Institute of Advanced Manufacturing Sciences, Inc. (IAMS®)
Real Time Estimation of 1-Dimensional Temperature Distribution for Precision Machine Tools Using Modal Analysis and Observer by J-Y. Ahn and S-C. Chung, Hanyang University
A Computational Approach to Evaluate Surface Integrity of Glass Ceramics by G. Zhang and Y. Cao, University of Maryland at College Park; D. Rokow, University of Medicine and Dentistry at New Jersey
Vitrification Heat Treatment and the Dissolution of Quartz by M.J. Jackson and B. Mills, University of Liverpool
12:00 noon - 1:30 p.m.
Lunch
1:30 - 5:00 p.m.
Painting Technology Workshop
Chair: Koos Sato, University of Kentucky
This workshop is open to all participants of NAMRC XXVIII and non-participants. There is no cost to attend the workshop but registration is required.
The painting technology consortium at the University of Kentucky is designed to develop a new generation of higher energy efficiency, which is more environmentally friendly than those currently available. Its current focus is on the application of computational fluid dynamics and scale modeling techniques.
5:00 p.m.
Conference Adjournment
TO REGISTER: Complete the information below and fax or mail the form with payment information to the University of Kentucky address provided. Registration fees can be paid by check, money order, purchase order or credit card in U.S. dollars only.

Please check appropriate box.

Dr. Mr. Ms. First Name: Last: 
Name Preferred on Name Tag:

Organization:

Address:

City: State:

Postal Code: Country:

Daytime Phone: Fax:

E-Mail:

Special Needs (diet or handicap access, etc.):

Authors/Authors' Visual Requirements:

REGISTRATION

Full Registration before May 3, 2000: $330.00

Full Registration after May 3, 2000: $400.00

Student/Retirée Registration: $20.00

Guest Registration (include guest name): $13.00

Painting/Technology Workshop: $45.00

TOTAL PAYMENT: $

Check here if you want to attend a special tour of Toyota Motor Manufacturing Kentucky, Inc. on Tuesday afternoon May 23, 2000. Space is limited, Advance registration only. Check Web site for availability at www.ame.org/tmm.

To pay your registration with a credit card, complete the following:

Card Member Name: 
Type of Card (please circle one): VISA
Account Number:
Expiration Date: 
Payment Amount: $ 

Authorization Signature:

MAIL your registration to:

Junita Groves, Conference Manager
Center for Robotics and Manufacturing Systems
220 B CRBS Bldg.
UK College of Engineering
Lexington, KY 40506-0108

ON-LINE Registration: See our home page at www.ame.org/tmm

E-MAIL your registration to 
groves@engr.uky.edu. Please include all information requested on the registration form including your method of payment.

FAX the registration form along with your credit card information to (606) 323-1035*. This line is available 24 hours a day.

IMPORTANT NOTICE - Reservations at the Radisson Plaza Lexington must be made by April 23, 2000 to receive the conference rate of $99.00 per night single/double/triple/quad.
Phone (606)231-9000* or fax (606)281-3794* to make your reservations.

* The (606) area code is scheduled to change to (859) effective April 1, 2000.