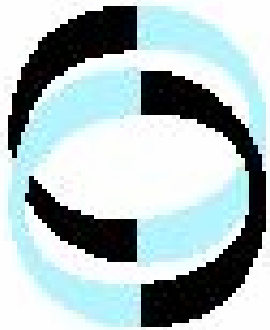
Leaders in Instrumentation, Controls, and Electronics
Partners in Economic Growth

June 29th, 2004

CASE

CASE WESTERN RESERVE UNIVERSITY

The University of Akron



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Ohio ICE: Mission and Rationale

The two-fold mission of Ohio ICE is to develop, science, engineering, and technology for the benefit of its members and to enlarge the scientists and technologists capable of working effectively within the Instruments, Controls, and Electronics Industry.

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Ohio ICE: Mission and Rationale

- **An industry-university consortium that focuses on the integration of computing, communication, measurement, and control with the intent of aligning the technology needs of industry with the multifunction needs of academia and the general need to increase research support for electrical engineering and computer sciences in Ohio**

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Ohio ICE: Mission and Rationale

- A cooperative research capability built upon a well-developed arsenal of regional research institutions that complement our business environment
- Research Centers from The University of Akron, Case Western Reserve University, and Cleveland State University will do much to boost Ohio's reputation as a leader in these areas

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Ohio ICE: Mission and Rationale

- **Industrial involvement in research planning and review will lead to direct technology transfer and help our universities capitalize more quickly the fruits of their research**
- **Please note that Beginning on page 20 the Consortium Joinder Agreement, the Consortium Agreement and a summary of the By-laws set forth the purpose and function of the consortium and the members' roles**

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Ohio ICE: Objectives

- **Perform industrially relevant research that improves industrial capacity, production and efficiency**
- **Perform research that develops new concepts, processing methods, and new analytical techniques**

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Ohio ICE: Objectives

- **Coordinate the educational systems at regional research institutions that match industry technology workforce requirements with university programs to both innovate and develop the training to apply new technology**

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Ohio ICE: Objectives

- **Promote the attractiveness of Northeast Ohio as a place for the location, growth, and development of ICE enterprises and the recruitment and retention of key talent to sustain them.**

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Ohio ICE: Research Programs

Ohio ICE involves 18 faculty+ from:

- **Electrical and Computer, Mechanical, and Industrial and Manufacturing Engineering departments at CSU**
- **Electrical Engineering and Computer Science department at Case**
- **Department of Electrical and Computer Engineering at the University of Akron**

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Ohio ICE: Research Programs

- **Project selection & implementation is to be guided by the Industrial Advisory Board that will meet twice a year.**
- **We have determined that Ohio ICE should launch itself by having several research projects identified and initially funded from membership commitments.**

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Ohio ICE: Research Programs

- **Upon final approval by the Industrial Advisory Board, appropriate faculty teams from Ohio ICE universities will prepare statements of work based on these projects. This approach is intended to foster collaboration, and the opportunity to seek higher levels of funding from other agencies in addition to the membership commitments.**

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Ohio ICE: Research Programs

- **These projects are clustered in the following research programs:**
  - **Sensors**
  - **Distributed systems and autonomous agents**
  - **Advanced Motion Control**

Ohio ICE: Research Programs

- **Advanced Sensor Technology**
  - functionality in harsh environments (dirt, temperature, humidity, vibration, etc.)
  - low power requirements
  - embedded algorithms for diagnostics and prognostics
  - small size

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Ohio ICE: Research Programs

- **Advanced Sensor Technology**
  - noninvasive
  - manufacturable in high volumes at low cost
  - high sensitivity (e.g., micro-g acceleration sensors)
  - high bandwidth (fast response time)
  - ability to communicate without wires

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Distributed systems and autonomous agents

- **Distributed Control Systems**
  - functionality in harsh environments (dirt, temperature, humidity, vibration, etc.)
  - low power requirements
  - algorithms for diagnostics and prognostics (of themselves, and also of the controlled objects)

Distributed systems and autonomous agents

- **Performance & Stability Verification System for Distributed Autonomous Agents small size**

  This area of research will focus on developing methodologies and systems to verify the performance and stability of distributed, autonomous sensor, actuator and control agents.

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Ohio ICE: Research Programs

- **Advanced Motion Control**
  - new path planning algorithms (in the presence of constraints)
    - splines (algebraic or other)
    - artificial intelligence
  - new electromechanical system configurations

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Ohio ICE: Research Programs

- **Advanced Motion Control**
  - new path tracking algorithms (in the presence of constraints
    - **nonlinear control**
    - **artificial intelligence**
  - estimation algorithms to reduce the number or accuracy of sensors that are required for feedback

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Ohio ICE: Membership and Activities

- **Everyone at this meeting will be on our mailing list and distribution list for the newsletter**
- **Formal membership does exist**

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Ohio ICE: Membership and Activities

Formal membership provides access to:

- **to both center-designated and company-sponsored projects.**
- **Collectively, member companies will solicit and fund proposals for center-designated projects in areas determined by the industrial advisory board to be of particular interest.**

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Ohio ICE: Membership and Activities

Firm-designated projects can also be initiated by each member company and both company researchers and university faculty and students collaborate closely on these projects.

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2004-2005 Annual Goals

- **Initiate a least one consortium-designated project that requires a research team comprising of two or more academic members and two or more industry members**
- **Obtain $300,000 outside grant support for research and education projects**

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2004-2005 Annual Goals

- **Hold three technical sessions, one at each of the consortium universities**
- **Achieve at least one start-up opportunity as a direct result of Ohio ICE activities**
- **Develop a plan to increase industrial partnerships to 20 by 2007**

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2004-2005 Annual Goals

- **Develop 5-year plan to increase the scale and scope of Ohio ICE to $10 to $15 million per year**
- **Develop a plan to add research collaborators**

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