



CASE

CASE WESTERN RESERVE UNIVERSITY

Cyber-Infrastructure Enabled Integration of Research and Education

Chih-Jen (Jackie) Sung

Department of Mechanical and Aerospace Engineering
Case Western Reserve University

Prepared for

NSF Workshop on Cyber-based Combustion Science

April 20, 2006



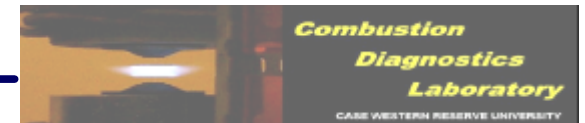
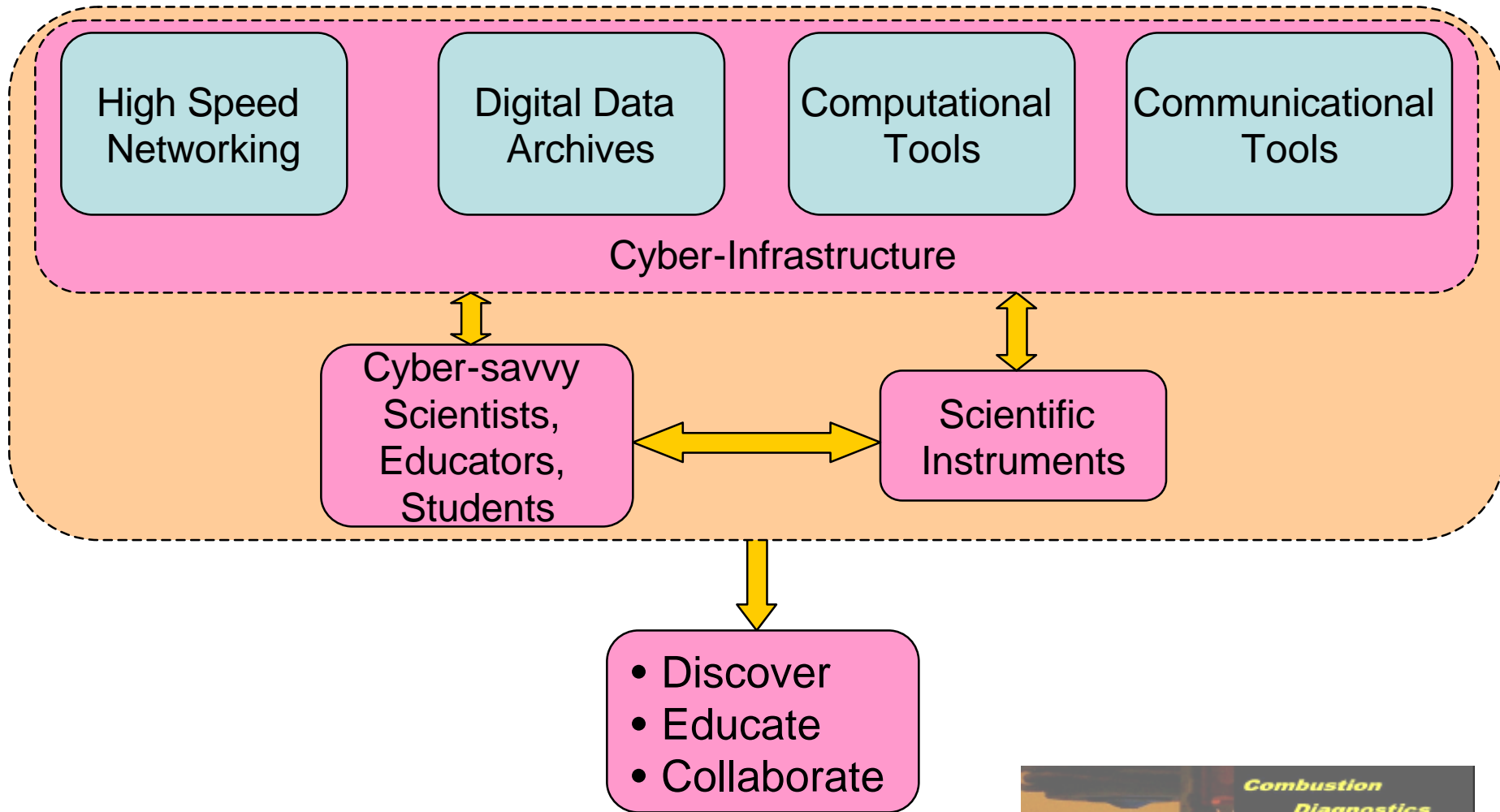


CASE

CASE WESTERN RESERVE UNIVERSITY

Cyber-Based Science

- Transformation in the way science is practiced and taught.





CASE

CASE WESTERN RESERVE UNIVERSITY

Educational Components of Current NSF Grant

- Graduate and Undergraduate Students
 - Electronic literature survey
 - In-house experiments
 - Integration of research in curriculum
- High School Mentorship
 - Research experience for pre-college students
- Dissemination
 - Creation of website
 - Multimedia tools
 - Experimental database
 - Thermochemical database





CASE

CASE WESTERN RESERVE UNIVERSITY

Cyber-Based Methods

- Systematic use of cyber-Infrastructure can greatly improve the educational effectiveness
 - Virtual experiments
 - Access to computational tools
 - Digital information/navigation resource centers for various target audience
 - Videos, videoconferencing
 - Internet teaching network
- Web-enabled Combustion Lab
 - Online experiments
 - Prerecorded videos of experiments
 - Provide students unlimited access to laboratory hardware and promotes distance learning
 - Chat window



Mechanical Engineering




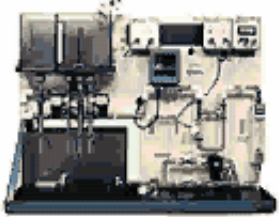



WEB-ENABLED MECHATRONICS/PROCESS CONTROL REMOTE LABORATORY

- HOME
- INFO
- DOWNLOADS
- EXPERIMENTS**
- CREDITS
- LINKS
- CONTACT

EXPERIMENTS

List of Experiments

**Professor Vikram Kapila
Polytechnic University**

 <p>RC Car</p>	 <p>Flexible link</p>	 <p>Water Tank</p>	 <p>Level Control</p>
 <p>Magnetic Levitation</p>	 <p>DC Motor</p>		 <p>Air Foil</p>

IMPORTANT NOTICES



CASE

CASE WESTERN RESERVE UNIVERSITY

Cyber-Infrastructure enabled Education

- **Scientists**
 - Collaborative research in multidisciplinary fields
- **Graduate/ Undergraduate Students**
 - Accessing/navigating digital information, computational tools
 - Training in cyber-infrastructure through curriculum
- **School Teachers**
 - Professional development
 - Bringing contemporary science to classrooms
- **School Students**
 - Easy access to science and technology
 - Reaching underrepresented sections
 - Attraction to science through virtual experimental and computational tools
- **Outreaching Communities/Organizations**

