

ISTEC 2008

**Integration of Simulation Technology
into the Engineering Curriculum**

a university - industry workshop

July 25th - 26th

The Statler Hotel, Cornell University, Ithaca, NY

Workshop Program

Sponsors:



Endorsed by:



The workshop program will explore the following themes in the context of engineering education:

- Integration of simulation with theory, experiment and design.
- Simulation technology as a platform for the integration of teaching and research.
- Using multi-physics software to convey to budding engineers the unity underlying disparate subject areas.
- Enhancement of the learning experience by using simulation software as a virtual lab environment amenable to hands-on, visual learning.

Program Overview

- Industry speakers will address how simulation technology is deployed in engineering practice including best practices and the consequent upstream implications for how we educate engineers.
- Speakers from academia will address the current status and future potential of simulation technology in engineering education.
- A panel on implementation issues will grapple with issues related to commercial software licensing and access at educational institutions.
- At a hands-on computer lab session, attendees can try out sample online learning modules and test drive a wiki-based web site for creating/updating modules.
- Recommendations for overcoming barriers and institutionalizing best practices will be developed via a breakout session and a final panel led by breakout session leaders.
- An area with displays and brochures from software vendors will be open throughout the event.

Friday July 25, 2008

7:45-8:30 am	<i>Continental breakfast in foyer adjoining amphitheater</i>	
8:30-8:40 am	<i>Welcome</i>	Lance Collins, Cornell University
8:40-8:50 am	<i>Remarks from the Dean</i>	Kent Fuchs, Cornell University
8:50-9:00 am	<i>Objectives and format of workshop</i>	Rajesh Bhaskaran, Cornell University

Session 1: Simulation technology in engineering practice**Chair:** Stephen Pope, Cornell University

9:00-9:30 am	<i>The past, the present and the future of CFD for design of rotating machinery</i>	D. Graham Holmes, GE
9:30-10:00 am	<i>Power & cooling trends- Industry thermal issues</i>	Roger Schmidt, IBM
10:00-10:30 am	<i>Verification and validation of FEA simulations</i>	Dave Conover, ANSYS Inc.

10:30-10:50 am	<i>Coffee break</i>
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Session 2: Simulation in education: Current status and future potential (1/2)**Chairs:** Keith Meintjes, GM and Ricardo Paxson, The Mathworks

10:50-11:50 am	<i>Strategies for the integration of simulation into engineering courses: Results from the Swanson Engineering Simulation Program at Cornell University</i>	Rajesh Bhaskaran, Cornell University
11:50-12:10 noon	<i>Integration of commercial codes and contemporary problems in thermal & fluid science curricula</i>	Dereje Agonafer, University of Texas at Arlington
12:10-12:30 pm	<i>Fluid flow simulations in the undergraduate fluids class</i>	John Cimbala, Pennsylvania State University

12:30-1:30 pm	<i>Lunch in the Taylor Room</i>
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1:30-1:50 pm	<i>Using simulation in capstone senior design projects</i>	Thomas J. Barber, University of Connecticut
1:50-2:10 pm	<i>Integrating computing, design and communication in Biomedical Engineering: Resource development over a decade</i>	Ashim Datta, Cornell University
2:10-2:30 pm	<i>Examples of inclusion of simulation in mechanics, design and core mechanical engineering courses</i>	P.Venkataraman, Rochester Institute of Technology
2:30-2:50 pm	<i>Thermal-structural FEM simulations in an aero-structures design course</i>	Alan Zehnder, Cornell University
2:50-3:10 am	<i>Development of a new integrated mechanism design and finite element analysis course</i>	Raghu Echempati, Kettering University

3:10-3:30 pm	<i>Coffee break</i>
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Session 3: Implementation issues

3:30-4:30 pm	<i>Panel: Commercial software licensing and access at educational institutions</i>	<p>Chair: John Swanson, Swanson Analysis Services, Inc.</p> <p>Members: Dereje Agonafer, University of Texas at Arlington Rajesh Bhaskaran, Cornell University Dave Conover, ANSYS Inc. Amadi Nwankpa, University of Michigan Lauren Wright, CD-adapco</p>
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Session 4: Hands-on computer lab session

4:30-4:50 pm	<i>Walk over to Rhodes Hall</i>
4:50-5:20 pm	<i>Hands-on session to try out Wiki for creating online learning modules</i> Led by Steve Weidner, Cornell University 471 Rhodes Hall; Overflow facility: 163 Rhodes Hall
5:20-5:50 pm	<i>Self-directed hands-on session to try out online modules used in the Cornell curriculum</i>

	471 and 163 Rhodes Hall
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6:00 pm	<i>Dinner, John Swanson Atrium, Duffield Hall</i>
7:30 pm	<i>Free outdoor concert, Arts Quad (Weather Gods permitting) Oculus: Alternative World Music</i>

Saturday July 26, 2008

7:45-8:30 am	<i>Continental breakfast in foyer adjoining amphitheater</i>
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Session 5: Simulation in education: Current status and future potential (2/2)

Chair: James Keller, Boeing

8:30-8:50 am	<i>Using Adams to produce learning moments</i>	Louis Everett, University of Texas at El Paso
8:50-9:10 am	<i>Combining research and education in aerospace structures: Challenges and opportunities</i>	Sham Gurav, Sameer Mulani, Mayuresh Patil and Rakesh K. Kapania, Virginia Tech
9:10-9:30 am	<i>A course sequence on particle transport, deposition and removal- Integration of simulation and experiment</i>	Goodarz Ahmadi, Clarkson University
9:30-9:50 am	<i>Teaching transport phenomena in Chemical Engineering using Comsol</i>	Joel L. Plawsky, Rensselaer Polytechnic Institute
9:50-10:10 am	<i>Integration of CFD into the Chemical Engineering undergraduate curriculum: A report from the CACHE CFD Taskforce</i>	Richard D. LaRoche, DEM Solutions and Charles A. Petty, Michigan State University

10:10-10:30 am	<i>Coffee break</i>
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Session 6: Planning for the future

Chair: Alan Zehnder, Cornell University

10:30-11:00 am	<i>Engineering education opportunities at NSF</i>	John L. Daniels, NSF
11:00-11:10 am	<i>Instructions for breakout session</i>	Organizing committee
11:10 am -12:10 pm	<i>Breakout session: Recommendations for overcoming barriers and institutionalizing best practices</i>	Alan Zehnder, Cornell Lance Collins, Cornell M.S. Anand, Rolls Royce Mehmet Dede, GE Albert George, Cornell
12:10-1:10 pm	<i>Lunch in the Taylor Room</i>	
1:10-2:30 pm	<i>Panel: Breakout session leaders reporting back to full group and plenary discussion</i>	Chair: John Swanson, Swanson Analysis Services, Inc.