ITTC 2009
Industry Advisory Board
and
KTEC Site Review

Joseph Evans
Director

Jim Stiles
Associate Director

Keith Braman
Director of Technology Commercialization

April 3, 2009
10:15 – 11:35 a.m.

New Directions and Projects

- Perry Alexander (IAL)
- Erik Perrins (telemetry)
- James Sterbenz (GpENI)
- Shannon Blunt (radar/comm)
Welcome
Introductions
State of the Center
Strategy and direction
Core competencies
Management team
Goals and objectives
Past two years’ progress on goals and objectives
Introduction
To be a global leader and strategic partner in the creation and commercialization of innovative technologies in information systems, networking and communications, bioinformatics, and radar.
FOCUS on RESEARCH:
To advance knowledge and create innovative technologies in information systems, network and communications, bioinformatics, and radar

FOCUS on STUDENTS:
To educate and train students for technology leadership

FOCUS on ECONOMIC DEVELOPMENT:
To transfer knowledge and innovative technologies to Kansas companies and national industries

By providing an outstanding interdisciplinary research and development environment
KTEC’s Mission: “To create, grow and expand Kansas enterprises through technological innovation”

ITTC works in partnership with KTEC network to foster technology-based economic development in Kansas

ITTC is the only state-designated Center of Excellence focused on information technology & telecommunications
State of the Center

Strategy and Direction
Focus on ideas

- Innovative concepts bring value to our students, our collaborators and the community, and the researchers themselves
- Provide an environment for the growth of our intellectual capital
- Discussions and seminars, with particular focus on the new faculty
- Enable rapid formation of research areas or clusters so that the organization properly represents ITTC expertise and capabilities
Grow our national and international reputation

- The success of research organizations is often facilitated by recognition of capabilities and competence
- Increase ITTC’s external visibility through focused visits and talks
- Enable and encourage the constituent laboratories and research groups to have greater visibility so that ITTC researchers can promote their work
Focus on relationships in order to increase external funding

- Continue to pursue traditional agencies and organizations such as NSF, but...
- It is important to build a network of potential funding opportunities, establish a positive reputation, and then be ready when an appropriate research solicitation is available
- Identify and pursue center-scale opportunities in conjunction with partners
- Build relationships to enable restricted or classified research opportunities to be pursued
Insure that ITTC is seen as critical to the University’s future

- Information technology is a foundational aspect of research in most fields of study
- Encourage interdisciplinary efforts that build upon the expertise of the researchers
Continue to support economic development by working closely with KTEC and other organizations

- KTEC survey established that there are 2,182 information technology companies in Kansas, employing nearly 62,000 IT workers (similar to Kansas biosciences sector)
- KTEC recently formed SITAKS, the Software and Information Technology Association of Kansas
- Opportunities for ITTC to establish closer ties with a wider range of Kansas companies, which can lead to research and commercialization opportunities
- Continue to encourage ITTC investigators to participate in technology transfer activities
Core Competencies
Communications & Networking Systems

Radar & Remote Sensing

Computer Systems Design

Intelligent Systems

Information Assurance

Bioinformatics

e-Learning

Systems Approach to Solving Problems
What questions are we trying to answer?

How to model, characterize, and understand “processes”?

- Communications networks
- Biological
- Signals such as communications and radar
- Cognition and reasoning

How to efficiently use resources?

How to design systems with assurances?

- Security, reliability, predictability

How to extract information?

- Detect “events” and find “entities” in data

How to deliver and present information?
Thrust Areas & Research Agenda

- Communications & Networking Systems
- Radar Systems & Remote Sensing
- Computer Systems Design
- Information Assurance
- Intelligent Systems
- e-Learning Design
- Bioinformatics & Computational Life-Sciences

How to model, understand, & characterize “processes”?

How to efficiently use resources?

How to design systems with assurances?

How to deliver & present information?

How to extract information from data?
ITTC’s Unique Facilities

Core Network and Experimental Fiber Links

Software

RFID Design

Computer Cluster
(768 cores, 35 TB)

Optical Systems Laboratory

And much more, including our greatest resource, our professional staff and facility
33 Tenure-track faculty
1 Research faculty
3 Postdocs
8 Technical staff
6 Support staff
Current student population ~ 106

- ~ 40 PhD, ~57 MS, ~9 BS
ITTC is Multidisciplinary

- Collaboration across engineering, education, math, biology
- Collaboration on computing cluster expansion (NSF MRI)
  - Chemical & Petroleum Engineering: Kyle Camarda
  - Molecular Structures Group: Jianwen Fang
  - Ecology and Evolutionary Biology: Mark Holder
  - Mechanical Engineering: Sarah Kieweg
  - Chemistry & Molecular Biosciences: Krzysztof Kuczera
  - Molecular Graphics and Modeling Lab: Gerry Lushington
  - Mathematics: Bozenna Pasik-Duncan
  - Natural History Museum, Biodiversity Research Center, and Ecology & Evolutionary Biology: A. Townsend Peterson
  - Natural History Museum and Biodiversity Research Center: Jorge Soberon
Technology Commercialization

- **Kansas start-ups**
  - Video Stream Comparison System (Veatros)
  - Rosetta SLD-Language & Tools (Cadstone)

- **Existing Kansas companies**
  - Neo Abacus
  - Sprint/Nextel
  - eLearning Creations

- **Internal commercialization efforts**
  - Duet-on-Pitch
  - RFID Microstrip Antenna
  - Rosetta SLD Tool Development
  - SAFFIRE
  - PMD Compensation
  - Meta Juris

Identifying and supporting early-stage opportunities is the key to ITTC’s continued commercialization success.

Today’s successes are the result of seeds sown and nurtured over several years.

Technology maturation and commercialization are integral to sustained success in information technology research and development.
Management Team
ITTC Organization

RGS / KUCR

ITTC Director

Executive Committee

Council of Investigators

Industry Advisory Board

Core Management Team

Technology Commercialization

KTEC/Technology Transfer Support

IP Maturation & Commercialization

Marketing and Public Relations

KTEC & Industry Liaison

Industrial Affiliates Program

Technology Transfer Advisory Committee

Research Laboratories

Radar Systems and Remote Sensing Lab

Bioinformatics & Computational Life Sciences Lab

Intelligent Systems Lab

Communications & Networking Systems Lab

Computer Systems Design Lab

e-Learning Design Lab

Information Assurance Lab

Nichols Hall Administration Support

Director's Program Assistant

Faculty/Staff/Student Support

Accounts Payable/Payroll

System/Network Administration
Internal

- Industry Advisory Board (annual meeting)
- Administrative management team (daily)
- Applied technology staff (weekly)
- Lab Directors (as needed)
- Council of Investigators (monthly)
- Technical staff (monthly)
- Administrative staff (monthly)
- Executive Committee (semi-annual)
- Core Management Team (as needed)
External

- KUCTC Technology Transfer Office (weekly)
- KTEC University Program Committee (quarterly)
- KTEC Commercialization Centers – LRTC, ECJC, WTC (quarterly)
- KU Center Research Directors (monthly)
- Community Partners – ITKC, LTA, Kauffman, … (monthly +)
Current Program Managers

- Victor Frost – Program Director, NSF Computer and Network Systems, Directorate of Computer & Information Science & Engineering (CISE)
- Glenn E. Prescott – NASA Program Executive for Technology

Former Program Managers

- Ron Hui – 2005-2007, Program Director, NSF Electronics, Photonics and Device Technologies
- Gary Minden – 1994-1996, Program Manager, DARPA Information Technology Office

Many faculty active in professional society leadership roles…
Goals and Objectives
Opportunities

- Research and energy of new ITTC researchers
- Continue to pursue possibilities for restricted research
- Build on NSF GENI and other recent successes
- Continue and expand ITTC’s activities in cognitive radios
- Build relationships with the US Army at Ft. Leavenworth and the Kansas Air National Guard at McConnell AFB
- Position ITTC for growth in information systems security
- Exploit ITTC’s RFID investments
- Work with other KU centers and institutes on multidisciplinary efforts in energy and transportation
- Federal stimulus funds!
## Goals

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<thead>
<tr>
<th>Metric</th>
<th>Current</th>
<th>2011 Goal</th>
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<tbody>
<tr>
<td>Research Expenditures</td>
<td>FY 08: ~$4.1M</td>
<td>~6M</td>
</tr>
<tr>
<td># of “Active” ITTC-Affiliated Tenure-Track Faculty</td>
<td>33</td>
<td>33</td>
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<tr>
<td># of Research Faculty</td>
<td>1</td>
<td>1</td>
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<tr>
<td># of Investigators</td>
<td>38</td>
<td>38</td>
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<tr>
<td>Funding per Faculty Investigator</td>
<td>~$142,000</td>
<td>~$210,000</td>
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<tr>
<td># of Technical Support Staff</td>
<td>8</td>
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<tr>
<td># of Postdocs</td>
<td>3</td>
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<tr>
<td># of Ph.D. Students</td>
<td>40</td>
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<tr>
<td># of M.S. Students</td>
<td>57</td>
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<tr>
<td># of Undergraduate Students</td>
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<td>15</td>
</tr>
<tr>
<td># of Journal Papers/Year</td>
<td>~125</td>
<td>~150</td>
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<tr>
<td># of Faculty in Leadership Positions</td>
<td>7</td>
<td>10</td>
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Recent Progress
Accomplishments & Activities

- Created the Information Assurance Laboratory
- Applied for NSA Center for Academic Excellence in Information Assurance Education, which will enable other NSA-sponsored programs to be pursued
- Awarded NSF GENI project
- Awarded large airborne telemetry projects
- Expanded the ITTC computing cluster through an NSF MRI award in collaboration with a multidisciplinary group
- Worked with KUCR / RGS to establish systemic foundations for growth of research computing at KU
- Sponsored a new / junior faculty research seminar series
*Note: In FY06 the CReSIS NSF Center is established and transitioned out of ITTC.*
New Research Areas

- Andy Gill
- Brian Potetz
- Bo Luo
- Gunes Ercal-Ozkaya
New Directions & Projects

- Perry Alexander
- Erik Perrins
- James Sterbenz
- Shannon Blunt
Discussion IAB and Peer Review team
Some ITTC IAB Discussion Items

1. What research questions does your organization need answered that ITTC might address?

1. What new fundamental science and engineering innovations are you tracking that ITTC should be aware of? These might feed into ITTC systems and engineering research.

1. What is/are the next national differentiators that ITTC should be looking to develop? For example, should ITTC pursue differentiators in our traditional areas of expertise (e.g., a national cognitive radio networking testbed) or seek to expand into other areas (e.g., a nano material research center).

1. Energy research will be a new growth area for the next decade. Are there any opportunities in energy research that you think ITTC could explore?

1. Given that the economy has forced scaling back of engineering resources at some organizations, is it possible to leverage ITTC resources to help advance your future efforts? For example, could ITTC contribute to optical or wireless network architecture design for future deployments or other efforts that might be resource-starved at the moment?

1. Do you have infrastructure the ITTC might be able to utilize in its research mission?

1. What is your 2, 3, and 5 year need for new students (BS, MS, and PhD)?