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## Independent Review Finds ITTC is State, National Resource

**A**s a Kansas Technology Enterprise Corporation (KTEC) Center of Excellence, ITTC undergoes biennial independent peer reviews. This spring a trio of experts assessed technology maturation, commercialization and other KTEC-funded components. They commended ITTC for its substantial intellectual property portfolio, including invention disclosures, U.S. patents and start-up companies. Reviewers called the federal Center of Excellence for Information Assurance designation a bold step that could produce great benefits for the Kansas IT industry. They also praised ITTC's significant investment in new faculty who, reviewers wrote, are bringing creative and innovative talent to bear on critical problems

**"The team agrees that ITTC is a high quality research center, and that it is a valuable resource not only to the State of Kansas, but to the nation,"** according to the evaluation. The review impacts the allocation and management of KTEC resources.

The review process included an advance study of reports and an April 3 site visit. Reviewers provided recommendations on how to enhance funding, depth of capability and ultimately economic impact on the state.

"Industry is highly complimentary of the work done by the Center, and at the same time believes there is a good deal of untapped potential," wrote reviewers. "The [Industry Advisory] Board is actively supportive, and this can be leveraged into greater financial and University support and industry relationships."



Director of Technology Commercialization Keith Braman (left) and ITTC Research Associate Professor Daniel Deavours discuss Deavours' latest radio frequency identification (RFID) tag. The tracking systems have led to multiple technology licenses, which are part of the ITTC intellectual property portfolio. An independent KTEC review praised the portfolio.

*Photo by Jason Daily*

"We have tremendous new investigators with budding research programs. While working with them, we will continue supporting our established researchers and their efforts," says ITTC Acting Director **Perry Alexander**. "Toward this end, we will adjust the internal ITTC laboratory infrastructure to help our researchers focus on potential new challenges, such as green energy and information security."

The review team consisted of **Tamal Bose**, professor of electrical and computer engineering at Virginia Tech; **Joe Harris**, deputy director of Manufacturing Science and Technology Center at Sandia National Laboratories and **Charles Holt**, manager of technology development at DuPont. ■

## Alexander Is Appointed ITTC Acting Director

**Perry Alexander**, professor of electrical engineering and computer science, has been named acting director of ITTC. Alexander served as director of ITTC's Information Assurance and Computer Systems Design labs before his appointment.



Perry Alexander

Alexander succeeds **Joseph Evans**, Deane E. Ackers Distinguished Professor of EECS, who is taking a leave of absence to continue his entrepreneurial work on the Tactical Ground Reporting System. The multimedia system allows soldiers in the field to collect and share information.

"Perry is an exceptional researcher and a dedicated mentor," Evans said. "His successful spin-off company, Cadstone, provides him with unique insights into commercialization. He is an excellent choice to advance the ITTC mission of research, education and technology transfer."

Priorities for Alexander include the continued development of new faculty. In the last five years, ITTC has gained nine new faculty researchers. Mentoring these researchers must be coupled with a more dynamic laboratory structure. According to Alexander, a more adaptable infrastructure will give ITTC researchers greater flexibility when addressing new challenges. ■

## Data Entry, Target Detection Tools Earn U.S. Patents

**I**TTTC researchers received notice of two U.S. patents. In September, **Danico Lee**, ITTC research engineer, earned a patent for *SmartXAutofill*, which reduces the time and effort needed for data entry. *SmartXAutofill* is an alternative to costly, error prone manual data entry. It makes suggestions to data fields based on approximate matches between values in past documents and the current document. The ITTC technology incorporates an ensemble predictor, integrating multiple predictive techniques from machine learning into a single architecture.

Lee and former ITTC investigator **Costas Tsatsoulis** and former ITTC student **Steve Perry** created the patented "*Automated Data Entry System*" with the observation that collections of data—whether in a database row or XML document—are usually related. For example, "prostate cancer" will appear only with "male" while "Lawrence" will appear only with certain states. *SmartXAutofill* not only supports the complexity of automated data entry but also detects discrepancies in legacy data.

Separating items of interest (namely detectable targets) from noise and interference in radar transmissions earned ITTC investigator **Shannon Blunt** and doctoral student **Tom Higgins** a U.S. patent in October. "*Computationally Efficient Adaptive Radar Pulse Compression System*" increases radar's sensitivity to smaller targets.

Pulse compression enables a radar to achieve high range resolution without using high peak transmit power by matched filtering upon reception. However, matched filtering of large target returns produces sidelobes, or interference, that can mask the presence of smaller nearby targets. For example in landmine detection by ground-penetrating radar, the ground can mask a mine. By adapting the filter to the received signal, sidelobes resulting from large targets can be suppressed. ■

The Link is prepared and published by ITTC. The Center is funded in part by the Kansas Technology Enterprise Corporation, a state-owned corporation created to stimulate economic development in Kansas. Articles in *The Link* may be reprinted for reuse without special permission from the editor or Center. We ask only that you credit ITTC for the information.

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“The technology I worked with at ITTC and my publications differentiated me from the majority of graduates applying for positions. My work at ITTC presented me with unsolved challenges that I had to often research extensively, and for which I couldn’t just look up the answer. This skill has been invaluable almost every day in my work.”

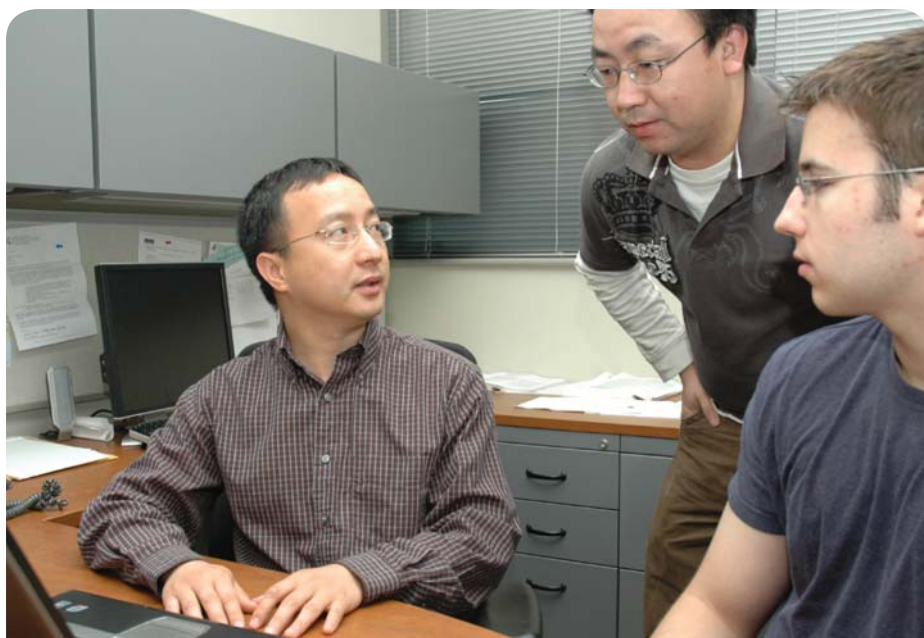
—Ted Weidling (MS Computer Engineering '07), Senior Software Engineer, Motorola, Lawrence

## Huan Receives Prestigious NSF CAREER Award

**I** TTC investigator **Jun “Luke” Huan** has been awarded a \$500,000 Faculty Early Career Development (CAREER) grant from the National Science Foundation. One of the most prestigious NSF awards in support of junior faculty, the five-year grant honors those who exemplify the role of teacher-scholars. Huan is the second ITTC researcher to receive the honor; **Xue-wen Chen**, director of ITTC’s Bioinformatics and Computational Life Sciences Lab, received a CAREER award in 2007.

Huan is applying computational techniques to improve data interpretation from chemical interactions with biological systems. His research is expected to accelerate drug discovery with a focused design process and to improve chemical toxicity monitoring in environmental protection, two major application areas of Huan’s research.

“When we look at chemical genomics—the complete set of genomic response to chemical compounds—we begin by dealing with highly complex raw data,” says Huan. “These data can often have thousands of dimensions as they relate to each other, and they are often incomplete and distorted. In addition, there is simply a staggering amount of data collected. Through developing new kinds of computational modeling we want to describe and then predict what certain chemical structures do to biological systems.”



ITTC researcher Jun “Luke” Huan (left) meets with Ph.D. students Jintao Zhang and Brain Quanz in his office. This summer Huan received a NSF CAREER Award, which honors junior faculty who exemplify the role of teacher-scholars.

*Photo by Jill Hummels*

Huan, an assistant professor of electrical engineering and computer science, is affiliated with the Bioinformatics Center, Bioengineering Program and the Center for Biostatistics and Advanced Informatics—all KU research organizations. He received his Ph.D. in computer science from the University of North Carolina at Chapel Hill in 2006. ■

# Young Kansans Return Home, Create High-Tech Jobs

**M** meet **Casey Biggs**—consultant. He is among a growing number of young Kansans who are returning home.

Biggs moved back in 2007 to pursue a master's in electrical engineering from KU, his alma mater. Consulting work was intended to help pay the bills during grad school, but one job kept leading to another opportunity. After graduating this spring, Biggs turned his full attention to building his consulting firm in Lawrence.



Casey Biggs

He specializes in field-programmable gate array (FPGA) design, signal processing and web application development.

"KU is a great school, and I knew I wanted to come back here for my master's," says Biggs. "When I graduated in 2000, there weren't many high-tech job opportunities in Kansas. There has

been quite a bit of growth over the last decade. I have a number of friends who have found high-tech jobs in-state or have stayed in Kansas by becoming consultants."

The Abilene native went to Colorado after graduating from KU in 2000. When the company he was working for was bought out, he saw it as an opportunity to go back for his graduate degree. The solid foundation and the critical thinking skills he developed during his undergraduate years led Biggs to return to KU. This time Biggs worked as a graduate student researcher in ITTC's Radar Systems and Remote Sensing Lab (RSL).

"Working at ITTC, I had the opportunity to conduct state-of-the-art research," says Biggs. "I was able to work with and learn from great faculty and fellow students. My time at ITTC enhanced my understanding and knowledge in many areas and will make me a more effective engineer." ■



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