

ITTC Receives National Honor for Cybersecurity Focus

The National Security Agency (NSA) and Department of Homeland Security (DHS) have designated ITTC/KU a National Center for Academic Excellence in Information Assurance Education.

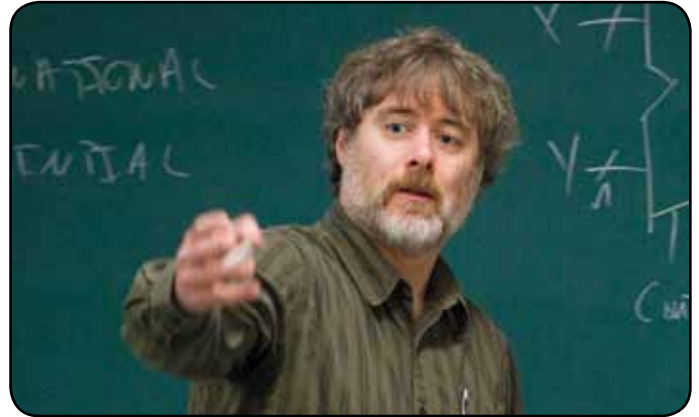
The ITTC/KU designation comes at a time when experts at the National Academy of Science and policymakers have identified cybersecurity as a key component in protecting banks, utilities, communications and other critical products and services. By educating the next generation of practitioners, performing fundamental research and reaching out to the community, ITTC serves as a regional center of expertise in support of the ongoing fight to protect the U.S. information infrastructure.

This is a testament to our national prominence in information assurance and cybersecurity education.

— *Perry Alexander, director of ITTC's Information Assurance (IA) Lab*

"This is a testament to our national prominence in information assurance and cybersecurity education," said **Perry Alexander**, director of the ITTC Information Assurance Lab. "The hard work and strategic vision of numerous KU faculty members and staff led to the University being accepted into this elite group."

ITTC and the Department of Electrical Engineering and Computer Science together form the core of KU's program. In working toward the NSA/DHS Center of Excellence designation, ITTC developed the Information Assurance (IA) Lab. The IA Lab serves as a University-



In establishing the Information Assurance Lab, Perry Alexander brought together diverse IA research expertise and academic resources within KU. As a Center of Excellence, KU serves as a regional center of expertise in support of the ongoing fight to protect the U.S. information infrastructure.

Photo Courtesy of University Relations

wide focal point for IA education, research and implementation. The new interdisciplinary lab includes researchers from EECS, mathematics and business, as well as KU's IT Security Office, which is responsible for implementing information security on campus.

"This designation recognizes the initiative and vision of numerous KU faculty and staff, and particularly Professor Alexander," said **Joseph Evans**, ITTC director and Deane E. Akers distinguished professor of EECS. "In establishing the IA lab, Professor Alexander brought together diverse IA research expertise and the rich academic resources of KU. The lab is the centerpiece of a holistic approach to securing the national information infrastructure."

The federal designation highlights the high value research being conducted at ITTC, said **Keith Braman**, director of ITTC technology commercialization. ITTC will leverage the designation to expand its research portfolio and expertise. Braman adds that he is looking forward to ITTC serving as a point of contact and support for local and regional companies in IA matters. ■

Frost Begins Appointment in Washington

Victor Frost, Dan F. Servey distinguished professor of EECS, has taken on a position as a program director in the Computer and Network Systems division of the Computer and Information



Victor Frost

Science and Engineering Directorate at the National Science Foundation (NSF).

The former ITTC director is working with the Networking Technology and Systems (NeTS) program within CNS. NeTS research supports the development of pervasive networks, available anytime, anywhere. Accessible from any communication device, future networks will be resilient to failures and malicious attacks. These dynamic architectures, protocols and technologies will evolve to accommodate growth and change.

Frost is the fifth ITTC investigator to work within federal research agencies. For more than a decade, ITTC faculty have helped set the nation's research agenda in computing, communications and sensors. ■

Three ITTC Technologies Earn U.S. Patents

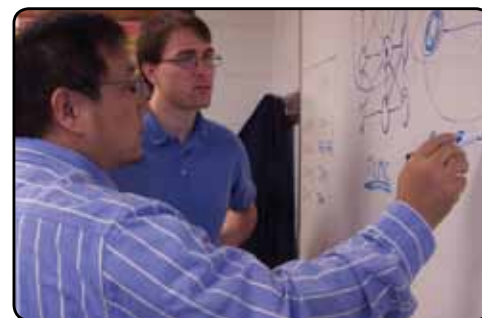
ITTC's Technology Commercialization Office (TCO) received notice of three new U.S. patents.

"We are excited about the commercial potential of each, and plan to work with our local business partners to develop them," says **Keith Braman**, director of TCO.

Xue-wen Chen, director of ITTC's Bioinformatics and Computational Life-Sciences Lab, received a patent for his "Method of Classifying Data Using Shallow Feature Selection." The new computational algorithm can detect genes related to some specific biological mechanism, such as biomarkers for cancers. It performs better than most of the existing methods in detecting biomarkers, molecules that signal a disease or condition.

I TTC investigator **Ron Hui** marks his 14th patent with "Laser System for Photonic Excitation Investigation." Conventional Coherent Anti-Stokes Raman Spectroscopy (CARS) provides high-quality three-dimensional (3D) images of living cells. CARS imaging requires the use of two different and expensive laser sources, which must be synchronized and maintained.

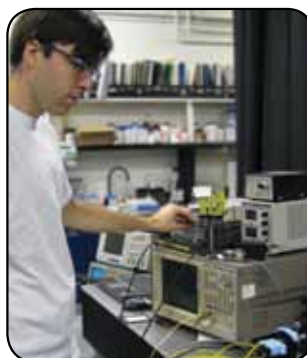
To enable greater accessibility of the powerful imaging



ITTC lab director Xue-wen Chen and his student, Department of Defense SMART Fellow Mike Wasikowski, explore techniques to mine massive data sets. Chen was issued a U.S. patent for his algorithm that detects genes related to specific biological occurrences, such as cancer.

tool, Hui and his students developed an affordable, compact and wavelength-tunable laser system. The ITTC system can be easily transported and used with current biological imaging microscopes.

Due to the efforts of ITTC Research Associate Professor **Daniel Deavours**, ITTC/KU has become a recognized leader in radio frequency identification (RFID) technology development. Deavours' latest invention, "Virtual Short Circuit for Providing Reference Signal in RFID Tag," enables more efficient and inexpensive manufacturing of RFID tags for asset tracking. It also provides better performance than competing technologies. It is one of several novel ideas ITTC is pursuing that creatively expand the utility of RFID tags. ■



As part of Ron Hui's project, Ph.D. student Peter Adany observes how optical fiber reacts in different situations and then creates computer simulation models to predict future behavior.

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“I have personally licensed three technologies from the University of Kansas and spun out two companies based on my research as a faculty member. Both companies grew in Kansas and were ultimately acquired. Each of the technology transfer activities resulted in jobs within Kansas and revenue back to the University and the state. None of this would have been possible without the support from KTEC [Kansas Technology Enterprise Corporation] to ITTC.”

– Susan Gauch, former ITTC investigator/ KU professor and current Rodger S. Kline leadership chair professor and head of Computer Science & Computer Engineering at the University of Arkansas

KU Collaborations Lead to New Search Tools for Business, Law

In order to turn innovative ideas into functional realities, two University of Kansas professors sought out ITTC expertise. The successful collaborations have resulted in a licensed technology and a prototype search engine that makes legal documents more accessible. ITTC Lead Software Engineer **Danico Lee** designed and developed both technologies.

neo Abacus has signed an exclusive licensing agreement for the Search Engine for Extracting Knowledge from Industrial Filings (SEEK). The technology searches tables, footnotes and entire Securities and Exchange Commission (SEC) filings for a desired keyword or words. **Rajendra Srivastava**, the Ernst and Young distinguished professor of business and director of the Ernst and Young Center for Auditing Research and Advanced Technology, conceived SEEK.

“This license agreement is an important step forward in helping us realize the potential our suite of technology holds,” said neo Abacus Chief Technology Officer **Christopher Ball** in a press release. Ball is referring to SEEK and FRAANK (the financial reporting and auditing agent), which were licensed at the same time.

Subscription-based databases dominate online legal research services. In addition to the prohibitive costs, **Michael Hoeflich**, John H. and John M. Kane distinguished professor of law, notes the databases require special training. Hoeflich envisioned a user friendly “one-stop shop” for legal research. He approached ITTC because of its software development experience.

The resulting search engine, *MetaJuris*, simultaneously searches various legal databases for cases, statutes and literature citations. The currently free service is at <http://metajuris.ittc.ku.edu/>.



MetaJuris, an ITTC-developed search engine, provides a user friendly “one-stop shop” for legal research. KU law students, above, tested the prototype last fall.

Photo by Mindie Paget

Users enter search words from which *MetaJuris* creates and submits queries to targeted legal databases. Version 2.0 mines six databases including PreCYdent (which contains U.S. Supreme Court and U.S. Court of Appeals cases), kscourts and Legalbitstream, which searches both tax cases and Internal Revenue Service rulings.

This past fall law students in two different classes, Contracts and Professional Responsibility, were asked to use and evaluate *MetaJuris*. Lee said it received positive comments.

“*MetaJuris* helps me find the most influential and authoritative cases on a particular issue,” said **Brian Jansen**, a first-year law student who used the metasearch.

The ITTC Technology Commercialization Office (TCO), which worked with both professors, specializes in technology maturation and transfer. TCO Director **Keith Braman** and his staff help move technologies from the lab to the private sector where they are developed into new products and services. ■

Quanz Receives National Science Foundation Fellowship

Ph.D. student **Brian Quanz** has been awarded a prestigious National Science Foundation (NSF) Graduate Research Fellowship (GRF). He will receive a \$30,000 annual stipend plus tuition and discretionary funds for up to three years. Quanz was among 950 fellowship recipients announced this month; on average, 10 percent of applicants are selected.

"The NSF GRF is a great achievement for Brian. It also reflects the strong graduate program that we have at KU," says Quanz' mentor **Jun Huan**, assistant professor of electrical engineering and computer science.

At ITTC, Quanz is devising artificial intelligence (AI) tools to process data collected from various sources in sensor networks. This data analysis is the foundation for a threat detection system used on ITTC's Transportation Security SensorNet (TSSN) project, which involves five faculty members and more than 10 research scientists, graduate students and undergraduates. Quanz' work enables objects to help determine their own safety along the supply chain.

His AI algorithms also have applications in ITTC's bioinformatics research. Genes, in effect, have "on/off" switches. ITTC investigators are examining why these genes, such as those in cancer cells, are expressed in some people while not in others. Quanz is attempting to expose the role that diet, stress and other environmental factors have in turning on those switches. ■



Ph.D. student Brian Quanz has developed algorithms, portions pictured behind him, that enable a threat detection system to monitor cargo en route. He recently received an NSF Fellowship.



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