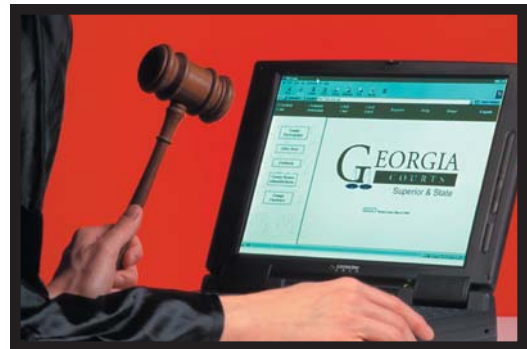
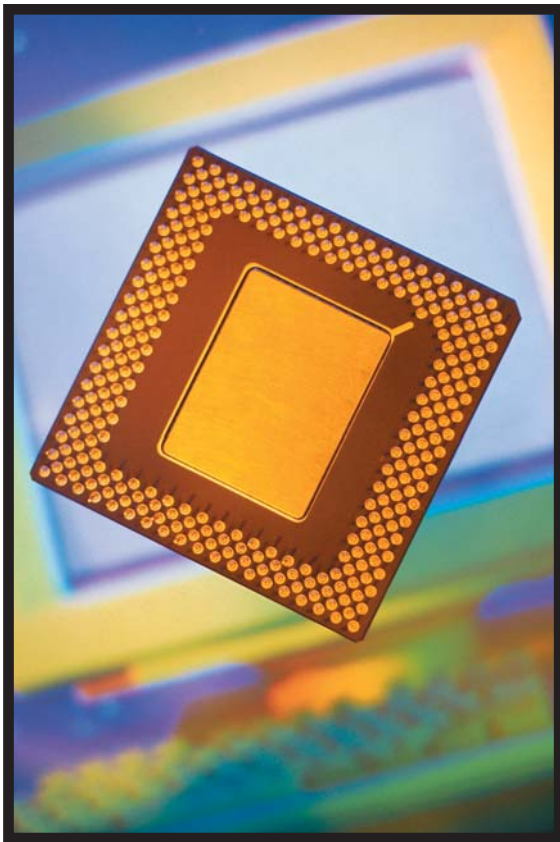


## Information Technology and Telecommunications



*Research programs in information technology at the Georgia Tech Research Institute (GTRI) offer solutions to complex problems involving information processing, storage, representation and exchange. GTRI performs research in Internet and database technologies and applications; broadband, defense, radio frequency and wireless communications; network applications and security issues; mapping/geographical information, distributed simulation and enterprise information systems; and product research and development, manufacturing preparation and other steps toward product realization.*

### **CHOOSING GTRI**

A nonprofit, applied research arm of the Georgia Institute of Technology, GTRI's full-time professionals bring cutting-edge technology and development skills combined with practical business experience. GTRI also draws on multidisciplinary talents from research and academic



*Used at Army installations across the country, the Wildcat Tracking System captures supply requisitions status in near real-time.*

faculty throughout Georgia Tech and a multitude of external contacts. For decades, GTRI has conducted more than \$100 million in contract-based scientific, engineering, computer technology and related research.

GTRI's researchers have the skills and resources in collaborative engineering and understand the components, designs and system integration to make a manufactured product at every stage in its evolution. Focusing on electronics, optoelectronics, embedded systems and information technology, GTRI is responsible for the development of products within such sectors as broadband multimedia delivery systems, digital telephony, networks, wireless applications, optical fiber communications and sensor systems.

### **EXAMPLES OF OUR WORK**

- FalconView, a Windows multimedia-mapping application developed to support flight planning, provides moving map display capability coupled with the ability to receive and plot a Global Positioning System feed in real-time for tracking vehicles. SkyView, a three-dimensional terrain-rendering program that works with FalconView, provides perspective previews of terrain based on available satellite imagery and digital terrain elevation data. GTRI is also applying collaboration technology within an operations center environment that will result in tools to increase the speed of decision-making speed and enhance the establishment of group memory.
- Our researchers have developed a methodology for transferring information among dissimilar databases, while maintaining the confidentiality, security and integrity of law enforcement-sensitive information. Secure systems work includes basic and applied research in advanced intrusion detection, security assessments, and hardware and software-based authentication.
- GTRI's Modeling and Simulation Research and Education Center (MSREC) has developed a human behavior modeling and integration testbed. The testbed focuses on many of the theoretical and practical issues associated with bringing human team-level behavior modeling together with military simulation, training, command and control and intelligent processing environments. GTRI has developed several technologies and software tools that enable federations of simulations to interoperate in a distributed network.
- Core enterprise architecture building blocks such as a sophisticated Public-Key Infrastructure, Extensible Markup Language (XML) schemas and data dictionaries, and self-describing and discoverable web services provide



*The Georgia Courts Automation System allows access to management information systems over a secure virtual private network.*

the platform for advanced services. These services include spatial queries, link visualization, and case-based and inference reasoning across the enterprise.

- Our Knowledge Management (KM) program facilitates information sharing and integrates processes for creating, capturing, organizing, accessing and using information and knowledge resources of an enterprise. The KM program has employed knowledge mapping, semantic maps, natural language search, XML, collaboration, distributed learning, data warehousing and data/metadata modeling.

- GTRI researchers have applied technologies and disciplines that support intelligent systems including knowledge representation and engineering, information extraction, filtering and fusion, pattern recognition, machine reasoning and learning, intelligent tutoring and software agents and natural language processing. These technologies have been applied to areas of military planning, criminal justice, intelligence, archival systems, medical care and resource management.

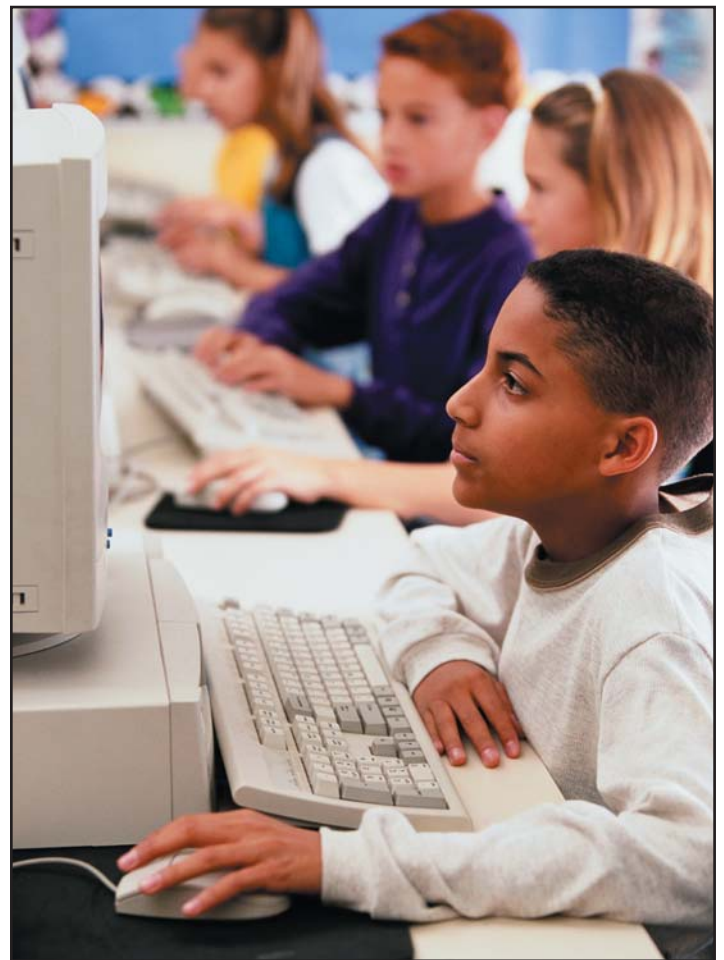
- In the Georgia Courts' Automation System, GTRI researchers have built six web-based applications that allow authorized users throughout the state access to management information systems over a secure virtual private network. These systems use a state-of-the-art network with multiple layers of security such as encrypted data file transmission, application-level user accounts and firewalls.

- GTRI provided a way to effectively manage and control the horizontal and vertical supply distribution process. The Wildcat Tracking System is in use at Army

installations across the country and allows users to capture supply requisitions status in near real-time and track the issue, transport and receipt of supply items on and between installations.

- Commercial and government enterprises have benefited from GTRI's support in performance and requirements assessment and test and evaluation of networks and systems consisting of communications elements, command and control systems, threat systems and demanding application scenarios. Specialized instrumentation such as the Realistic Operational Communications Scenario (ROCS) system is used to define scenarios, instrument systems under test and aid in system integration.

- GTRI also performed R&D programs for OEMs, service providers and government and commercial end-users of broadband communications networks. These programs



*GTRI is a key contributor for "Foundations for the Future," a collaboration of higher education institutes and industry representatives working to leverage telecommunications technology investments and improve K-12 educational practices in Georgia.*

include many focused on hybrid fiber/coaxial (HFC) networks, Digital Subscriber Line (DSL) and broadband wireless including WiFi. Projects addressing the evolving multi-vendor, multi-protocol world of high-speed backbone and access networks are conducted through the Network Applications Integration Laboratory (NAIL). NAIL focuses on multi-protocol label switching (MPLS), IP, and ATM broadband transport technologies including dense wavelength division multiplexing.

- GTRI's extensive history in radio frequency and wireless is being carried forward in wireless technology and systems programs spanning from very-low frequency systems to millimeter-wave systems with concentrations above the HF band. Research, development and consulting work in wireless ranges from small system evaluation studies to multi-year, multi-million dollar development programs using up-to-date hardware/software design tools. The Georgia Tech Broadband Institute has established a Software Radio Laboratory in the Georgia Center for Advanced Telecommunications Technology (GCATT). This laboratory is a testbed for research, development, test and evaluation of concepts in software radio and communications.

### **APPLIED RESEARCH AND CAPABILITIES**

- Information Security and Assurance
- Mapping/GIS
- Modeling and Simulation
- Database Technology
- Broadband Communications
- Radio Frequency and Wireless Communications
- Intelligence Systems and Knowledge Management
- Performance and Requirements Assessment of Networks and Systems

### **WHAT CAN GTRI DO FOR YOU?**

- Bring advanced technology to the field at a low cost.
- Promote integration of new technologies into existing domains.
- Help organizations adopt the best new technologies for their needs.
- Apply years of comprehensive experience to reach a common goal.
- Help companies move products rapidly from concept to market with comprehensive technology selection, product design, prototyping, production preparation, product data documentation and testing assistance.



*Developed to support flight planning, FalconView and SkyView provide moving map display capabilities to track vehicles and 3-D perspective previews of terrain based on satellite imagery and digital elevation data.*

### **FOR MORE INFORMATION**

To learn more about what GTRI can do for your organization in information technology and telecommunications, visit us on the web at <http://www.gtri.gatech.edu>.

Or, contact:

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