

Intelligent Automation, Inc.

www.i-a-i.com

Mission

Intelligent Automation, Inc. (IAI) conducts technology research at the highest level of professional excellence. We aggressively promote the insertion of the resulting technologies into the marketplace by designing and developing innovative technologies, electro-mechanical systems, and software products and by partnering with firms well positioned in particular domains. IAI serves its stakeholders by doing outstanding work on the frontline of technology, maintaining a professional environment in which staff members can fulfill their professional and personal objectives, and establishing and sustaining enduring relationships with our clients and partners.



Core Advantages

IAI is very effective at developing technologies from their conception through the design, building, and testing of prototype systems. We can rapidly develop solutions for customers, mature the technology to a functional prototype stage, and transition the technology through programs, partnerships, and products.

Profile

Intelligent Automation, Inc. (IAI) is a technology innovation company headquartered in Rockville, MD. We specialize in providing advanced technology solutions and R&D services to federal agencies, and corporations throughout the United States and internationally. Leveraging agile R&D processes, a multi-disciplinary collaborative environment, and its substantial intellectual property portfolio, IAI excels in developing concepts into market-focused products and customer-driven solutions. IAI's core R&D areas include: Air Traffic Management, Big Data and Social Media Analytics, Control and Signal Processing, Cyber Security, Education and Training Technologies, Health Technologies, Modeling and Simulation, Networks and Communications, Robotics, and Sensor Systems.

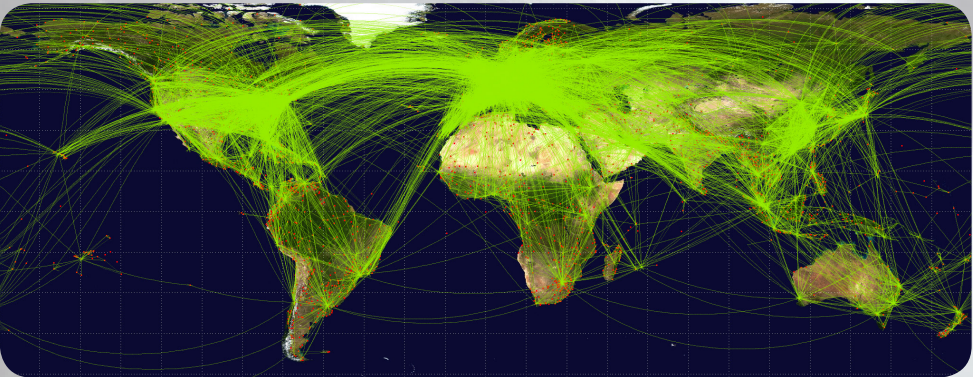
Core Competencies

Our research is supported by a cross-disciplinary team of over 165 research scientists and engineers, with backgrounds in aerospace engineering, computer science, cognitive science, education, electrical engineering, mechanical engineering, physics, and robotics. The strength of IAI is in its people. Broad technical expertise and the cross-fertilization of ideas among our core technologies has been our path to innovation and excellence. IAI's core competencies include:

Air Traffic Management

IAI has considerable expertise in Air Traffic Management (ATM), in developing cutting-edge tools for both NASA and the Federal Aviation Administration (FAA), and using them to solve topical problems in the aviation community. Our team of researchers and engineers has experience developing several tools, including NASA's Airspace Concepts Evaluation System (ACES), NASA's Multi-Aircraft Control System (MACS), NASA's Air Traffic Operations System (ATOS), Department of Transportation's (DOT's) Aviation Environmental Design Toolkit (AEDT), and FAA's TARGETS system. In addition, we have expertise in developing a number of visualization and analytical tools to better understand and translate the large quantity of data produced by these models into actionable information for aviation decision makers. IAI also conducts research into all aspects of Unmanned Aerial System (UAS) impact studies regarding communication, loss of separation, and UAS vehicle modeling. Our expertise in this area includes:

- Aerospace-related Computer Applications
- Unmanned Aerial System Studies
- Next Generation Airspace System (NextGen) Concept Development and Research
- System-Level Modeling, Simulation, and Analysis



Big Data and Social Media Analytics

IAI has considerable experience in the research, development and transition of innovative Big Data Analytics tools, applications, systems and technologies. We have expertise in the areas of Data Mining and Informatics, Natural Language Processing and Text Analytics, and Social Media Analytics. IAI's Big Data solutions are applied to many areas including scientific data analysis, health informatics and intelligence analysis. Our expertise in this area includes:

- Data Mining and Informatics
- Natural Language Processing and Text Analytics
- Social Media Analytics

Control and Signal Processing

IAI specializes in applying advanced signal processing and machine learning techniques to diverse engineering problems ranging from health management of electro-mechanical systems to chemical and biological agent detection and classification to cognitive readiness and mental health assessment. We have considerable expertise in determining Operator Functional State (OFS) assessment by studying human fatigue based on voice, eye tracking and physiological signals including ECG, EEG, and respiration. IAI's Cognitive State Assessment in Real Time (C-START) system for NASA accurately monitors OFS during flight, and our voice-based Post Traumatic Stress Disorder (PTSD) assessment system for the Army Telemedicine and Advanced Technology Research Center (TATRC) screens and monitors individuals at high risk for PTSD. Our machine learning-based tools and products include ABMiner, a multipurpose agent-based data-mining software product; MCT, a Matlab-based automated multi-class data classification tool; and ListEn, a voice-based Post Traumatic Stress Disorder (PTSD) assessment engine.

IAI conducts extensive research and development in Structural Health Monitoring (SHM) and Non Destructive Evaluation (NDE), leveraging our expertise in sensor design and development, modeling and simulation, signal processing algorithms, system integration and testing, and wireless in-situ monitoring. We have developed individual sensors and wireless sensor networks that use ultrasonic guided waves to detect defects in composite material, metallic, and concrete structures. IAI also develops ultra-wideband (UWB) Time Domain Reflectometry (TDR) to detect hard and soft faults in electrical cables for mission critical systems. Our suite of ultrasonics-based structural health monitoring technologies has a wide spectrum of applications, including aircraft, ships, and civil infrastructure. Our expertise in this area includes:

- Advanced Machine Learning
- Non-Destructive Evaluation/ Structural Health Monitoring

Cyber Security

IAI provides practical and customized solutions for protecting the network, the information, and the overall system. We use advanced technologies and have extensive hands-on experience with wireless network security, cyber-attack analysis and mitigation, and cyber security testing and training. Our practical research and development is guided by the latest cryptographic theories. IAI's long history of collaborating with leading technology vendors, academic researchers and federal program managers helps us understand specific problems and tailor our solutions. Our expertise in this area includes:

- Wireless Network Security
- Cyber Attack Analysis and Mitigation
- Cyber Security Testing and Training

Education and Training Technologies



IAI applies the latest research in computer, behavioral and learning sciences, game design, engineering, and mathematics, to develop innovative solutions in education, in training and performance enhancement assessment methods, and in improving human-computer and human-machine interfaces. We are leaders in creating Immersive Training Environments that provide effective, intelligent, and adaptive training in all spheres of instruction, including

the military and the K-12 community. We also develop innovative Human System Integration products, using human factors engineering principles to improve human-system interfaces. Our expertise in this area includes:

- Adaptive Learning
- Immersive Training Environments
- Human System Integration

Health Technologies

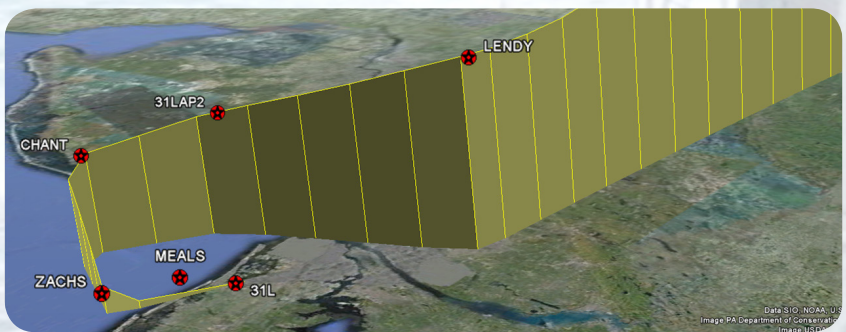
IAI is actively engaged in research, development and the transition of innovative health related applications, systems and technologies. We are leader in developing mobile health solutions that fully engage the user by going beyond basic interactions and providing new functionalities that leverage the power of mobile platforms. IAI is active in health-IT and informatics focused on the areas of clinical decision support, Geographic Information Systems (GIS), health data mining, and natural language processing. We leverage our extensive experience in developing innovative sensors, devices, and systems for biomedical applications. We develop serious games including web, first-person, social, mobile, and massively multiplayer online games for improving health, and for assisting therapy, behavior changes and health education. IAI is an industry leader in large-scale, agent-based distributed modeling and simulation, and has developed innovative solutions in the areas of medical logistics and operations. Our expertise in this area includes:

- Mobile Health
- Health IT & Informatics
- Biomedical Systems
- Serious Games & Training
- Modeling & Simulation

Modeling and Simulation

IIAI is a leader in the development of distributed simulations that emulate the behavior of physical systems and large complex networked systems. Our Modeling and Simulation (M&S) team has extensive expertise with a breadth of M&S COTS software and tools including Matlab™, Mathematica, Labview, EMANE, CORE, NS-2, Qualnet, Opnet, OMG's DDS AGI's suite of tools, GOTS tools such as OneSAF, HLA, TENA, and NASA tools such as ACES, ATOS, MACS and FAA tools such as TARGETS and AEDT. IAI has also commercialized several modeling and simulation tools and infrastructures. Our expertise in this area includes:

- Distributed Architectures and Solutions
- Electromagnetic Simulation
- Human System Integration



Networks and Communications

IAI specializes in the design, development and production of a wide spectrum of networking and communication technologies for both military and civilian applications. We provide solutions in domains ranging from the battlefield to vast computer systems, and from wireless and satellite communications to local- and wide-area network protocols. We work on different aspects of advanced networking and communications, involving protocols from physical to application layers, and in the areas of Advanced Wireless Networking, Network Analysis and Management, Network Evaluation, and Advanced Radio Communication and Antenna Technologies. We use our extensive experience in collaborating with leading technology vendors, academic researchers and federal program managers to uniquely tailor our technology solutions. Our expertise in this area includes:

- Advanced Wireless Networking
- Network Monitoring, Analysis and Management
- Network and Protocol Evaluation
- Radio Communications and Antenna technologies

Robotics and Electromechanical Systems

IAI has considerable expertise in developing custom solutions for challenges in Optical Systems, Machine Vision, Autonomy, Human-Machine Interface, Mobile Robotic Manipulation and Inspection, as well as Electromechanical System Design. We develop solutions for real-time image stabilization, target detection and tracking with applications ranging from small arms fire control systems to real-time localization systems in the hospitality industry. Our ballistic matching system is currently in operation worldwide and helps law enforcement agencies identify suspects in any crime where guns are used. We develop systems for applications including the fusion of image-based data from multiple sources, vision-based navigation, anomaly detection in Full Motion Video (FMV), and defect detection on rough surfaces. We design and develop motion capture systems, robots to assist in damage assessment and rehabilitation for NASA, as well as for physical rehabilitation of victims of stroke for NIH. Our expertise in this area includes:

- Machine Vision & Optical Systems
- Autonomy & Human-Machine Interface Technology
- Robotic Manipulation, Inspection, Maintenance & Repair
- Electromechanical System Design

Sensor Systems

IAI specializes in developing advanced sensor systems for military, transportation and medical applications, transportation. Areas of focus include radar, location and tracking, non-destructive evaluation/structural health monitoring, and electronic systems. We design, develop, and customize sensor systems to the meet requirements of our clients by conducting system analysis, identifying the appropriate sensor architectures and sensors based on state-of-the-art components, implementing the sensor system, and demonstrating it in the relevant environment. IAI has extensive experience with a wide range of sensor modalities including electromagnetic, acoustic, optical, and electrical. We are also active in the simulation, test, and evaluation of sensor systems. Our expertise in this area includes:

- Radar
- Location and Tracking
- Non Destructive Evaluation/Structural Health Monitoring
- Electronic Systems

Products

- ARGUS™, a RF-based perimeter security system
- BulletTrax 3-D™, a forensics imaging equipment used for bullet matching by law enforcement agencies worldwide
- CybelePro™, a software framework for the development of agent-based systems DCF, an integrated Distributed Control Framework for robot team coordination and management
- GradAtions™, an intelligent reading comprehension tutor for helping learners improve their reading proficiency and learn new text-based information in an efficient manner
- KTG™, a medium fidelity wheels off to wheel on 4D trajectory generator for modeling and simulation based validation of trajectory based operational concepts
- MOXIEfit, a personal virtual trainer that keeps the user motivated with a simple achievable weight loss program
- RFnest™, a wireless network emulator
- WireCheck™, an extremely sensitive Time Domain Reflectometer designed specifically for detecting chafing and other soft faults in cables

Customers

Government agencies include Department of Defense (DoD), National Aeronautics and Space Administration (NASA), National Institutes of Health (NIH), Department of Energy (DoE), Department of Homeland Security (DHS), Department of Justice (DoJ), Department of Commerce (DoC), and Department of Transportation (DoT). Commercial customers include several major first tier systems integrators including BAE Systems, Boeing, CSC, EDS, Honeywell, Lockheed Martin, Northrop Grumman and Raytheon.

IAI's technologies have been transitioned into several key programs and systems including:

- ADL SCORM S100D testbed
- Air Force Life Cycle Management Center
- Army Future Combat Systems (FCS)
- CDS CIMS
- Deployable Force Protection and ONR
- FAA's Integrated Arrival Departure Procedures effort
- Joint Service Small Arms Programs
- Joint Strike Force (JSF) Program
- NASA's ACES and UAS Programs
- NAVY AEODRS Program
- NASA ECOSAR Program
- NAVY Aegis program
- NAVAIR PMA 268 Scalable Network Access Protocol (SNAP)

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