

DRAFT

TEAM

Vice President for Research
Texas A&M University

Systems Theoretical Approach to Counter IEDs (Project STACI)

Our team and collaborators come from across the Texas A&M University Campus and from private and non-profit organizations. A strength of our team is the combination of real-world, applied experience combined with research science and academic perspective. Each has brought to the table a complimentary asset for our success.

Internal Texas A&M

Institute for Scientific Computation

Norman Borlaug Institute for International Agriculture

Immersive Visualization Center

Aerospace Engineering Department

AggieSat Satellite Lab

Academy for Advanced Telecommunications and Learning Technology

Center for Geospatial Information Science and Technology (GIST)

Department of Atmospheric Sciences

Sustainable Coastal Margins Program (SCMP)

Continuing and Professional Studies Office (CAPSO)

Outside Collaborating Organizations

Night Vision and Electronic Sensor Directorate

ZOOM Technologies, Inc.

Missouri Resource Assessment Partnership (MoRAP) at the University of Missouri-Columbia

Missouri Department of Natural Resources (MoDNR), Hazardous Waste Program (HWP), Federal Facilities Section (FFS)

Project Principle

Dr. Richard Ewing, Ph.D., Director, Institute for Scientific Computation, Texas A&M University (Project Principal)

Project Leaders

Andrew Skadberg, Ph.D., Overall project management, systems approach GIS/spatial analysis, Office of Vice President for Research, Texas A&M University (Project Lead) –

Dr. Skadberg has been involved in natural resource management issues since 1985. He has also focused on extending technologies from government and educational institutions fostering the services they can provide to the public sector for over a decade. While focusing on GIS and natural resource management decision making, he jointly developed a decision support system with Dr. Yongxia Skadberg called Texas Regional Analysis Planning Support System (TRAPSS). TRAPSS combined the power of a relational database with GIS and spatial analysis capabilities (Microsoft Access and ESRI – Arcview).

This technology and other Web-based applications designed to support economic diversification and resource conservation led to Dr. Skadberg co-founding the first company (AdventGX Corp.) to spin out of Texas A&M under the Technology Transfer Commercialization Initiative (TTCI), under Dr. Richard Ewing. This experience and eighteen years of active application of systems approach and multi-disciplinary perspectives for solving environmental resource management problems has prepared Dr. Skadberg to provide leadership support to Dr. Ewing under this research endeavor. Skadberg's accomplishments extend across a wide range of applications but generally related to sustainable development, technology development and natural resource managements. Highlighted accomplishments:

- Co-founder of AdventGX Corporation, 1st company “spun” out of TAMU’s Technology Transfer Commercialization Initiative (TTCI) under the Vice President for Research.
- In 2003, initiated new generation of travel information systems and wireless internet “portals” at DOT safety-rest areas in the U.S. (i.e. TexBox pilot project, and Road-Connect WiFi in Texas – wireless Internet now installed in Iowa, Nevada, Oregon, California, Florida and other states are preparing to deploy). Collaborating with Zoom Info. Systems and awarded contract with State of Minnesota, Iowa, Nevada and bidding on Texas.
- Co-developed 3 software applications registered with the Technology Licensing Office at TAMU.

Current Responsibilities include:

- Evolving Higher-ed Extension activities and examining the role of technology to create commercialization and technology transfer from universities and public institutions, while extending benefits, education and outreach to the public domain.
- Examining how the Internet is impacting rural and developing places as it relates to natural resource conservation and sustainable economic development.
- Development of Web based educational resources for communities and resource managers interested in technology and decision support systems for effective resource utilization and management.
- Development of centralized information systems to facilitate rural community, land management and enterprise decision-making.

Robert Moss, Ph.D., EOIR Technologies Inc., Hyperspectral imaging hardware and software design

Dr. Robert Moss is a physicist with nineteen years experience in quantitative imaging and data visualization. As a Principle Scientist at EOIR Technologies Inc., his primary responsibility is the technical oversight of the US Army’s Night Vision and Electronic Sensors Directorate (NVESD) Special Products and Prototyping Division Intelligence Sensors Technology Branch hyperspectral program, where EOIR serves as the prime system integrator. His interests include hyperspectral sensor design, automated processing of hyperspectral data, target and material identification algorithms, and geocoding.

Prior to working for EOIR Technologies, Dr. Moss was the Technology Manager at Alto Technology Resources, Inc. He was directly responsible for all Alto hardware and software resources, including all computers, networking equipment, as well as spectral cameras and hyperspectral imaging spectrometers (TEEMS).

Highlights of some of Dr. Moss’s accomplishments in the field of remote sensing include

- Created an extensive software library for georectification and automated processing of hyperspectral data for NVESD which is used by numerous government agencies.
- Integrated and delivered two state of the art hyperspectral airborne hyperspectral sensors for NVESD
- Designed and implemented hardware modifications to add an IMU subsystem to the TEEMS sensor.
- Developed software to integrate the new IMU data into the TEEMS sensor model, thereby significantly improving the accuracy of the automated geo-rectification process.
- Designed and participated in numerous field collections of hyperspectral data all over the world.

J.R. Starch, Overall project management, aviation support & IED intelligence support, Hyperion Legion International, LLC

Mr. Starch currently holds the position of Chief Operations Officer for Hyperion Legion International, LLC, and a Texas-based ITAR registered company. His company performs services in aviation as well as in the import and export of defense trade articles. Mr. Starch is a former U.S. Marine aviator in the KC-130 Hercules. As a current graduate student at Texas A&M University, he is pursuing a PhD in engineering as well as a Masters in International Affairs at the George Bush School of Government and Public Service. A number of the systems approaches conceived in this proposal will have National Security policy implications, and as such will be concurrently studied in this research framework.

His recent experience includes over 3 years working in Iraq and Afghanistan as a security contractor with the U.S. Army Corps of Engineers in Iraq. During the course of performing duties, Mr. Starch was assigned as the intelligence and operations officer for the convoy teams, and was directly exposed to IED and VBIED detonations on numerous occasions. His experience with interpreting, assessing and responding to enemy Techniques, Tactics and Procedures (TTP's) is of high importance to the stated mission for which this proposal is submitted. His work with TTP's offers critical insight for the effective employment and training for hyperspectral devices.

In previous experience, Mr. Starch has worked in the following project areas:

- 2004-2005 Served as the U.S. Army Corps of Engineers' Captured Enemy Ammunition **Mobile Team Company Commander** for convoy security to and from remote site in various locations around Iraq. (\$50+ Million)
- 2004-2005 Served as Intelligence and Operations officer in Iraq, operating from Baghdad. Directly responsible for the collection and analysis of intelligence products, operational planning, communications integration and convoy execution in the field. Deployed with all convoy teams with the various products used to determine operational constraints and efficiencies.
- Survived multiple IED's, VBIEDs, and numerous fire-fights involving small arms and coordinated attacks on Coalition personnel.

Modeling, Data Analysis

Anthony Filippi Ph.D. Texas A&M University (Hyperspectral remote sensing & GIS)

Dr. Filippi is currently an Assistant Professor in the Department of Geography, Texas A&M University, College Station, TX, USA. He was an Office of Naval Research (ONR)/NASA summer fellow at Friday Harbor Laboratories, University of Washington, in 1998, and he has been a faculty fellow at Oak Ridge National Laboratory (ORNL) during the summers of 2005, 2006, and 2007. His research interests include hyperspectral remote sensing, ocean optics, machine learning, and GIS-based modeling.

Dr. current research interests focus upon the development of hyperspectral remote-sensing inversion algorithms to estimate coastal bathymetry and water-column and bottom optical properties, as well as terrestrial biophysical properties. In addition, he has developed general-purpose high-dimensional classification and other information-extraction methods. Recent articles and projects highlight his knowledge and breadth of experience with hyperspectral research:

- Filippi, A. M. (2007) "Derivative-neural spectroscopy for hyperspectral bathymetric inversion," *Professional Geographer* 59(2): 236-255.
- Filippi, A. M., and Jensen, J. R. (2007) "Effect of continuum removal on hyperspectral coastal vegetation classification using a fuzzy learning vector quantizer," *IEEE Transactions on Geoscience and Remote Sensing* 45(6): 1857-1869.
- Filippi, A. M., Carder, K. L., and Davis, C. O. (2006) "Vicarious calibration of the PHILLS hyperspectral sensor using a coastal tree-shadow method," *Geophysical Research Letters* 33, L22605, doi:10.1029/2006GL027073.

- Filippi, A. M., and Jensen, J. R. (2006) "Fuzzy learning vector quantization for hyperspectral coastal vegetation classification," *Remote Sensing of Environment* 100: 512-530.
 - Jensen, J. R., and Filippi, A. M. (2005) "Thematic Information Extraction: Hyperspectral Image Analysis," In Jensen, J. R., *Introductory Digital Image Processing: A Remote Sensing Perspective*. Third Edition, Upper Saddle River, NJ: Prentice Hall, pp. 431-465.
- Projects*
- Co-PI. Title: "Advancing Geospatial Skills in Science and Social Sciences (AGSSS) – Track 1, GK-12." Source of Support: National Science Foundation (NSF), NSF 04-533 Graduate Teaching Fellows in K-12 Education (GK-12). NSF Proposal Number: 0440511. Funding awarded: \$1,104,501. Start Date: 06/01/05.
 - Co-PI. Title: "Hurricane Katrina Technical Assistance." Source of Support: National Park Service (NPS) contract. Funding awarded: \$28,050. Start Date: 09/08/05.

Clayton Blodgett, Ph.D., University of Missouri – Conversion of hyperspectral data and product development

Clayton F. Blodgett is the Remote Sensing Coordinator at the Missouri Resource Assessment Partnership (MoRAP) at the University of Missouri-Columbia. Dr. Blodgett has 14 years of remote sensing and geographic information system training and experience. His interests are focused on linking remote sensing, geographic information systems, and spatial statistics/environmental modeling to address problems in biogeography and landscape ecology.

Currently Dr. Blodgett is the Remote Sensing Coordinator (2000-present), Missouri Resource Assessment Partnership (MoRAP), University of Missouri, Columbia, Missouri. He serves as technical consultant and development manager on projects dealing with remotely sensed information. He writes and manages grants and employees, and provides remote sensing and geographic information system education and training to employees, partners, and students.

Dr. Blodgett has been involved with remote sensing since 1987 and has been principle investigator on several projects involving the application of hyperspectral remote-sensed images for solving environmental problems and natural resource management. In the last eight years he is responsible for generating nearly \$1.5 million in research in this area. Highlighted projects include

- 2006-2008 EPA Wetland Program Development Grant. *Restoration and Protection of Missouri River Wetlands: a Pilot Project*. Principal investigator. (\$100,000).
- 2006-2007 Missouri Department of Natural Resources Hazardous Waste Program grant. *Hyperspectral Imagery Analysis support for the Missouri Department of Natural Resources*. Principal investigator. (\$50,000).
- 2002-2003 Raytheon Synergy IV. *Forestry Infomart Development*. Co-investigator. (\$175,000).
- 2001-2003 EPA-Rare Grant. *Urban Remote Sensing for Land Use Change and Impacts*. Principal investigator. (\$100,000).
- 1999-2002 NASA-Remote Sensing Applications Research in Agriculture, Forestry, and Range Resources Management (NRA-98-OES-09). *Remote Sensing-Based Geostatistical Modeling for Coniferous Forest Inventory and Characterization*. Co-author. (\$560,000).

Special Technical Experts and Support Personnel

Larry Flournoy – bio

UAV & Satellite Vehicle Deployment and Training

Helen Reed PhD., Department Head for Aerospace Engineering, Texas A&M University (aerial, UAV, and satellite employment of sensors, technical expert) –

Helen L. Reed is Professor and Department Head of Aerospace Engineering at Texas A&M University (2004 to present). Dr. Reed has 14 years of leadership and experience in space flight and satellite design, and 25 years in aerodynamics and fluid mechanics, specifically boundary-layer transition and flow control. Her interests are focused on unmanned aerial vehicles and micro aerial vehicles (UAVs and MAVs), integrated concurrent engineering, rapid prototyping capabilities, satellite design, responsive software and hardware systems, autonomous rendezvous and docking, and student education.

Dr. Reed established the AggieSat Lab satellite program in March 2005, and the Tactical Unmanned Aerial Vehicle Laboratory and the Unmanned Flight Test Center in Fall 2006 within Aerospace Engineering at Texas A&M. AggieSat Lab has two major missions under development: one with the Air Force in close proximity tracking, and an 8-year campaign of 4 missions with NASA Johnson Space Center for autonomous rendezvous & docking. The UAV group seeks to advance subsystem research (aerodynamics, power, flight control, ...), embrace network centric operations, provide expertise in aircraft qualification and certification, and promote rapid design and prototyping.

Dr. Reed has been principal investigator on several projects involving her areas of interest. Since arriving at Texas A&M in December 2004, she has already generated nearly \$1 million in external research. Highlights of her career include:

- 2000 ASUSat1 – 13-pound nanosatellite on the inaugural Orbital Sciences “Minotaur” mission out of Vandenberg AFB in January.
- 2004 Three Corner Sat – Satellite constellation on the Delta IV Heavy Demo mission out of Cape Canaveral in December. 2 of 3 satellites launched; 3rd in Air & Space Museum
- 1997 Elected Fellow of the American Society of Mechanical Engineers
- 2003 Elected Fellow of the American Physical Society
- 2007 Awarded the J. Leland “Lee” Atwood Award from the ASEE Aerospace Division and AIAA – the award is bestowed annually upon an aerospace engineering education in recognition of outstanding contributions to the profession

Joseph Perez, Director of the AggieSat Lab Student Satellite Program, Aerospace Engineering, Texas A&M. (aerial, UAV, and satellite employment of sensors, technical expert)

Joseph Perez is Director of the AggieSat Lab Student Satellite Program. He specializes in the design, fabrication, build and test of space systems and sub-systems, he has also installed and manages the Quality Assurance Program, Configuration Management System and Operation and test procedures for all process within the AggieSat Lab.

He has been a NASA certified instructor for most of the technician skills involved with satellite fabrication and build. Over the past 5 years he has been mentoring and instructing undergraduate and graduate students on the design and build of space systems.

Over the past 20 + years he has been either active duty military doing research and development or a DOD contractor for the Air Force Research Lab at Kirtland Air Force base. He has worked on multiple satellite programs as the lead for integration and test director for these programs.

- He has been involved with the NanoSatellite Program, which challenges higher education institutions to put together and build a space mission.
- He was responsible for electrical integration and flight test qualification of all Air Force Phillips Laboratory Space and Balloon Payloads.
- He led electrical and mechanical integration and test of the MightySat II.1 spacecraft.
- He was responsible for the telemetry and communications system, power system integration and test, attitude control system testing, flight software test and maintenance, all environmental testing, and launch integration and test procedures to include launch of the satellite.

- He was responsible for the fabrication, testing, and Integration of the DHS (Data Handling System) for the STRV1d spacecraft, fabrication of MAPLE4, TRAM (Transmit/Receive Antenna Module) control board, and integration of all experiments for the ETB (Electronic Test Bed).
- He assisted in the building of the Micro Control Module for the Mission Research Corporation and Air Force Research Laboratory. Fabricated and tested the MPID (Micro Particle Impact Detection) experiment for MightySat 1. Provided rework and repair of the MightySat 1 bus and structure.

Military Applications – Intelligence, and Remote-sensing Application

Nick Carbone, U.S. Navy - Military Intelligence, Industry - Intelligence Applications, State - Environmental Applications of Hyperspectral Imagery

Mr. Carbone is a retired U.S. Navy intelligence officer of 24 years, with an academic background in aerospace engineering. After retirement he worked in the defense industry for 11 years at Geodynamics, Logicon, and Northrop Grumman. His military background was used on a multitude of DOD funded projects, identifying new intelligence and information requirements for current operations, and applying existing sensors to new requirements.

He recently left full-time employment with the Missouri Department of Natural Resources (DNR) where he managed federal grants totaling \$2 million annually, including a Environmental Protection Agency (EPA) funded project to evaluate applications of Civil Air Patrol's (CAP) airborne Hyperspectral Imagery (HSI) system for environmental emergency response and identifying contamination. He remains part-time with DNR to continue follow-on studies focused on the use of HSI to determine the extent of lead and zinc contamination, particularly in residential areas, from mining operations in southern Missouri.

Highlights of remote sensing experience includes:

Military - December 1966 to July 1990:

- Coordinated real-time and standing National and theater intelligence collection requirements, and developed plans for future intelligence systems and capabilities at U.S. Naval Forces Europe.
- Managed USS SARATOGA's intelligence center, integrating national, theater and the ship's tactical reconnaissance assets to support operations.

Defense Industry - August 1990 - July 2001:

- Directed User Needs requirements assessment for Air Force Space Command/Phillips Lab Integrated Space Technology Flight (ISTF), small satellite sensor program.
- Supported planning and execution of Navy Space and Naval Warfare Systems Command's (SPAWAR) Maritime Tracking Exercises to evaluate national and theater surveillance capabilities versus low-profile merchant ships.
- Planned and coordinated merchant ship tracking experiments in two Fleet Battle Experiments, coordinating multi-sensor tracking, and increasing cross-cueing between national and tactical assets.

State of Missouri – May 2002 – June 2007

- Project Manager for grant to evaluate applications of CAP's airborne HSI system for Environmental Emergency Response and identifying chemical contamination. Report at <http://www.dnr.mo.gov/env/hwp/hsi/hsi-project.htm>.
- Project Manager for follow-on HSI projects related to lead and zinc mining contamination.

Project Architecture, Systems Approach, Decision Support and Training

Lewis Ntamo, Ph.D., Assistant Professor, Industrial and Systems Engineering Department, Texas A&M University – Systems engineering processes, large-scale stochastic optimization, and discrete event modeling and simulation

Dr. Ntaimo's research interests are in systems modeling and engineering processes; large-scale stochastic optimization with a focus on algorithms for stochastic programming; and discrete event modeling and simulation using DEVS. Recent applications of interest include modeling and simulating wildfire behavior and firefighting¹, and emergency response optimization for wildfire suppression and containment, health care systems design, and supply chain inventory planning with private information,

Currently Dr. Ntaimo directs the systems modeling and computational optimization lab, Industrial and Systems Engineering department, research advisor for the Arizona Center for Integrated Manufacturing and Simulation (ACIMS), and Faculty advisor for the Institute of Industrial Engineers Student Chapter at Texas A&M University. He writes research papers and manages grants, advises undergraduate and graduate students, and teaches undergraduate courses (Operations Research, Facilities Planning and Material Handling) and graduate courses (Systems Thinking and Analysis and Large-Scale Stochastic Optimization).

Dr. Ntaimo has been involved with systems modeling and simulation development for wildfire spread and containment for the last five years and is the principal investigator on the following research projects:

- 2007-2009 CSR-CSI: System Integration of Dynamical Data Driven Wildfire Spread and Firefighting Modeling, Simulation, and Optimization. PI: L. Ntaimo. Sponsor: National Science Foundation Grant No. CNS 0720470. (\$80,000)
- 2005-2008 Dynamic Data Driven Integrated Simulation and Stochastic Optimization for Wildland Fire Containment. PI: L. Ntaimo, Co-PI: X. Hu, Georgia State University. Sponsor: National Science Foundation Grant No. CNS 0540000. (\$206,000)

Yongxia Xia Skadberg, Ph.D. - Decision Support, Spatial Analysis and Software Integration

Dr. Skadberg has been working in the area of GIS, remote sensing, spatial analysis and decision support systems since 1996. Her strengths include geospatial technologies, computer programming and the development of online tools for decision support and information exchange. While focusing on GIS and natural resource management decision making, she jointly developed a decision support system called Texas Regional Analysis Planning Support System (TRAPSS). TRAPSS combined the power of a relational database with GIS and spatial analysis capabilities. This platform of technologies led to the development of several independent online applications in the Dept. of Recreation, Park and Tourism Sciences at TAMU.

Yongxia Skadberg's current responsibilities as an Assistant Director with the Texas Rivers Institute at Texas State University (TSU) focus on developing technologies and applications to coordinate research and information management using remote sensing, database and GIS technologies. Currently the institute collaborates with numerous organizations including USDA, USEPA, etc., and several other universities through-out the southwestern U.S. She also is working extensively on a number of online applications for the Vice President for Research at TSU.

- Blanco River land use and land change and its hydrological impact decision support system – this is an ongoing project. Objectives of this project include: 1) Characterize historic and current land use and land cover attributes and dynamics in the river basin using remote sensing technologies, 2) develop a simulation model to simulate land use changes in the river basin and to identify driving forces that are behind the land use change, and predict future land use and land cover change using the simulation model for the years from 2025 to 2050, 3) simulated stream flow and non-point source pollution consequence scenarios based on current and future land use and land cover change
- *TexBox Tourism and Community Network Portal* -- a traveler information kiosk network developed for the Texas Department of Transportation. Currently (Sept. 2007) this project is being re-bid for 102 rest areas across the state in combination with WiFi access.
- *Texas Regional Analysis and Planning Support System* -- A multi-purpose Web-based GIS information system that supports regional planning. The system manages and delivers regional information and data about the physical features, land use, demographics, socio-economic, transportation, education, environment

and crime for the Austin-San Antonio corridor in Texas. The system features Internet mapping and database reporting.

- GIS system of landfills, water features and public water supply intakes for six Councils of Governments in Texas.

Jan Fernandez – Troop Training - Place Holder content

Dr. Fernandez has extensive experience in higher education management and administration of projects, programs, staff, and curriculum. She is also involved in several national professional associations as a member, journal reviewer, and frequent presenter. Her Ph.D. research included International Agricultural Development, Training, Skills Needed to Work in Cross-cultural Settings, Sustainable Development, and Community Development. Her Master's Degree is in Tourism and Resources Development, and her Bachelor's Degree is in Wildlife Biology and English.

Past professional experience includes conducting or facilitating training programs, promoting and implementing conferences and seminars, managing a national corporate grant which trained 10,000 teachers throughout the state of Texas in train-the-trainer models, managing a federal grant program which placed university students as tutors in school districts, managing university-wide reciprocal exchange study abroad programs, facilitating international study groups, facilitating community tourism needs assessment projects, and hospitality training for hotel and restaurant managers and staff members.

Additionally, her experience includes extensive training in international development, including travel in Guatemala, Mexico, Nicaragua, Germany, Italy, Canada, Scotland, England, Ireland, and France.

Jamshid Gharajedaghi, Ph.D. – Executive Advisor – Project Architecture, Systems Approach

Dr. Gharajedaghi is managing Partner of INTERACT, has more than thirty years of experience with the practice of systems methodology in design and the development of business architecture, planning, learning and control systems. His work has taken him into corporations and government agencies around the world for both private and public concerns.

Mr. Gharajedaghi was formerly the Director of The Busch Center, the research arm of the Social Systems Sciences Department, and Adjunct Professor of Systems Sciences at The Wharton School, University of Pennsylvania (1979-1986). He began his career with IBM's World Trade Corporation where he served as a Senior Systems Engineer (1963-1969). He left IBM to become CEO of the Industrial Management Institute (1969-1979).

- Dr. Gharajedaghi serves on several boards including, The Research Board of the International Systems Institute, USA (1983 - 1992), The Governing Body of the Asian Productivity Organization, Japan (1972 - 1979), The Board of Trustees for Azad University, Iran (1976 - 1979), Regional Chairman of the Society for General Systems Research - Asia (1975 - 1979)
- He was the project manager for two internationally acclaimed projects: New Economic Order, an United Nations project, Goals for Mankind, a Club of Rome project
- Dr. Gharajedaghi has been involved with numerous organizations to redesign businesses, product(s) and/or processes, some examples include : Ford Motor Company, Aluminum Company of America (ALCOA), NYNEX Science & Technology, Inc Oneida Tribe of Indians of Wisconsin, Commonwealth Energy Systems, Chrysler Corporation, Carrier Corporation.
- Mr. Gharajedaghi has written several books, including Systems Thinking, Managing Chaos & Complexity, A Platform for Designing Business Architecture, Prologue to National Development Planning, Towards a Systems Theory of Organization, and A Guide to Controlling Your Corporation's Future. He is the author of numerous published articles in various international scientific and management journals.

Mike Fritch, ZOOM Technologies, Inc. – Software integration, Mobile mapping and imaging analysis

Mr. Mike Fritsch is President of ZOOM Information Systems, a company specializing in Transportation Informatics. He has a diverse technology background and is experienced at all levels from low-level electronic and software design to project, program and corporate management with both small and large companies. He has participated in over 70 information technology and product development projects from an implementation to management level. His career started as an electrical engineer at ITT, but soon left to join a small software company as a software engineer. That company eventually became Logikos, one of the largest custom software developers in the Indiana, and Mike rose through the ranks to lead the company as President.

Mr. Fritsch has been involved with implementing and project managing a diverse range of systems including digital spatial imaging and data fusion systems, embedded consumer electronics systems, state government kiosk and internet-based e-government systems, DOD database and communications systems, space-based systems, automotive information systems and many more. He has also been involved in process improvement and software process creation with many companies.

- At Logikos, he led the in-car-based software development of the OnStar™ System.
- After leaving Logikos, Mike created The Mainz Group LLC formed in 2002 to pursue several technology ideas and funding.
- Funded Indiana 21st Century Fund, Mike and his new partner renamed The Mainz Group to ZOOM Information Systems in 2004 to pursue ARTIIS and related projects and ZOOM took off from there and now has national acclaim and exposure.
- One of ZOOM's focuses is on advancing Indiana's position as a major player in the Intelligent Transportation Systems (ITS) technology and the transportation information cross roads of America.

Advisory Board

Ron Robinson, Ph.D

Dr. Robinson was the President of Texaco Technology Division and in October 2001 he became Professor and Department Head of the Harold Vance Department of Petroleum Engineering at Texas A&M University where he held the Albert B. Stevens Endowed Chair in Petroleum Engineering. His background also includes the founding of several technology start-ups. Robinson currently serves on the Texas Governor's Science and Technology Council, in addition to being a board member to a number of industry's top institutions.

Edward Hiler, Ph.D.

Dr. Edward A. Hiler serves as the Ellison Chair in International Floriculture within the Department of Horticultural Sciences in the College of Agriculture and Life Sciences at Texas A&M University. He assumed this role in January, 2005. He served The Texas A&M University System as Vice Chancellor for Agriculture and Life Sciences, Dean of the College of Agriculture and Life Sciences, and Director of Texas Agricultural Experiment Station, an appointment he assumed in September of 1992. In August of 1998 he assumed an additional role as Director of Texas Cooperative Extension. He provided overall leadership for The Agriculture Program of The Texas A&M University System; agencies including: Texas Agricultural Experiment Station, Texas Cooperative Extension, Texas Veterinary Medical Diagnostic Laboratory, Texas Forest Service, and Texas Wildlife Damage Management Service.

John Campbell, Ph.D.

Dr. Campbell serves as the President Emeritus and Professor of Animal Science, Oklahoma State University, Stillwater, OK (1999-present). Dr. Campbell served as President from 1988 – 1993. Dr. Campbell was at the University of Illinois, Urbana-Champaign, IL from 1977-1988 where he served as Dean of the College of Agriculture (1983-1988) and Associate Dean (1977-1983). Dr. Campbell has been active in initiatives to re-vitalize and innovate higher education. He has published a number of books. Two prominent books are Reclaiming a Lost Heritage: Land-Grant and Higher Education Initiatives for the 21st Century and Dry Rot in the Ivory Tower: A Case for Fumigation, Ventilation, and the Renewal of the Academic Sanctuary.

Wei Zhao, Ph.D.

Dr. Wei Zhao currently serves as the Dean of Science and Professor of Science at Rensselaer Polytechnic Institute (RPI) (2007 – present). Prior to that Dr. Zhao jointly was a Senior Associate Vice President for Research, Texas A&M University and Division Director, Computer and Network Systems at the National Science Foundation (2005-2007).