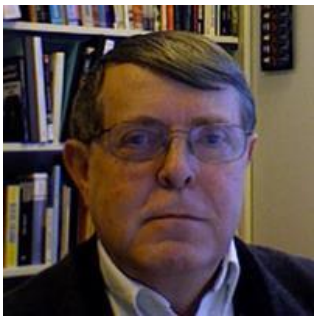
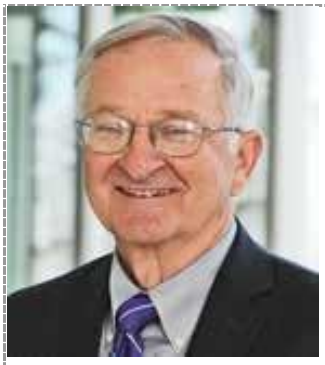
PAST I/ITSEC FELLOW RECIPIENTS

 **2010** **Jack Thorpe, Col, USAF (Ret), Ph.D.**	Dr. Thorpe served in the Air Force as an R&D officer for 26 years. He earned his Ph.D. under a program offered by the Air Force Institute of Technology at public/private universities. Unusually, nearly half his career was spent at DARPA as a Program Manager, Office Director, and Special Assistant to the Director. He created and managed the DARPA SIMNET program and was a founding contributor to the Command Post of the Future program. He was also involved in the development of MicroTravel, Video Arcade Trainers, Desk Top Simulators, the Defense Simulation Internet, the 60% Solution methodology, Interactive History, the Electronic Sand Table, the Double Helix methodology, and SIMNET U and C2U ("U" for university). Dr. Thorpe is on the advisory board of the Army's Institute for Creative Technologies, and is the former Chair of DARPA's Information Science and Technology study group. He is still active in planning and structuring advanced research projects, lately in the area of Strategic Collaboration. Portions of this work involve applying DoD advanced technology to responding to extreme scale disasters, which involves working with California first responders.
 **2010** **Paul K. Davis, Ph.D.**	Dr. Davis is a senior principal researcher at RAND and a professor of policy analysis in the Pardee RAND graduate school. His research has been in strategic planning (primarily for defense), advanced methods of analysis and modeling, and decision making theory. He has published extensively on capabilities-based planning, multi-resolution modeling and exploratory analysis under uncertainty, implications of modern decision science for support of high-level decision making, portfolio-analysis methods for capabilities planning, and social science for counterterrorism and stability operations. Dr. Davis was a senior executive in the Office of the Secretary of Defense before joining RAND. Dr. Davis has served on numerous panels for the National Academy, Defense Science Board, and intelligence community. He is a regular reviewer for several scholarly journals. His degrees are a B.S. from the University of Michigan and a Ph.D. from M.I.T. in chemical physics.

 **2011** **General Paul F. Gorman, USA (Ret)**	General Gorman retired from the Army in May 1985, forty years from the date of his enlistment in the Navy during World War II. In his final assignment, he was Commander-in-Chief, U.S. SOUTHERN COMMAND, 1983-1985. His service included three years of infantry combat in Korea and Vietnam, an assignment with the U.S. delegation to the Paris Talks on Vietnam, with CIA as a National Intelligence Officer, and with the Joint Chiefs of Staff first as J-5, then as Assistant to two successive Chairmen. In 1971-1972, General Gorman was President of the Army's Board for Dynamic Training, and from 1973 to 1977 he served as Deputy Chief of Staff for Training at Headquarters, Training and Doctrine Command, overseeing reforms of the Army's training system. He has been an innovator in the Army's use of information technology, both on active duty and since. In 1995 the Society for Computer Simulation International presented him its Founders Award for Distinguished Service, citing "his many pioneering contributions to the methodology and application of simulation to military defense and preparedness." He has served on Mitre's Army Advisory Board, on the Army-DARPA Advisory Board, and on the Advisory Board of General Atomics.
 **2013** **Colonel James E. Shiflett, USA (Ret)**	Colonel Shiflett has long been recognized as a leading technical innovator within the US Army and DARPA. He has led seminal programs within the training and simulation community, including the original DARPA SIMNET program and the Army's Close-Combat Tactical Trainer (CCTT). He originated the concepts behind the first development of Semi-Automated Forces (and created the SAF name as well), describing their first implementations as something like the "night of the living dead". Colonel Shiflett also created and led the original Synthetic Environment Data Representation and Interchange Specification (SEDRIS) program. Colonel Shiflett was the first Technical Director of the Defense Modeling and Simulation (DMSO). He is currently Vice President for Program Management at SAIC where he has served as the Director of FCS Training Systems.

 **2015** **Andy Ceranowicz, Ph.D.**	Dr. Ceranowicz, Science Advisor at Alion, earned his Ph.D. in Electrical Engineering from The Ohio State University. He has been involved in simulations for training since the earliest days of the DARPA SIMNET program when he was the lead engineer responsible for the development of the original ModSAF capability and later the development of the SIMNET SAF capability. When ownership of the DARPA Synthetic Theater of War (STOW) Advanced Technology Demonstration (ATD) transitioned to the Joint Forces Command, Dr. Ceranowicz accompanied the program, becoming the chief engineer for JSAF development as well as leading the development of the experimental program embodied in the Millennium Challenge 02 federation. Dr Ceranowicz is also responsible for the development of a more efficient class of simulated entities that represented 10,000 distinct entities during JFCOM experimentation. Using supercomputers of the time, this same approach led to the simulation of 350,000 entities in single exercises. Dr. Ceranowicz is also a longstanding member of the I/ITSEC community, having received 5 subcommittee nominations for the conference "Best Paper" award and winning that recognition in both 2002 and 2004.
 **2015** **Dr. Duncan (Duke) Miller**	Dr. Duncan (Duke) Miller has been a key figure in the development of distributed simulation for 30 years. In 1983, he formed and led the development of the SIMNET system and protocols. He chaired the Distributed Interactive Simulation (DIS) Technical Committee that developed the DIS Standards, and served on the government/FFRDC team that developed the High Level Architecture (HLA). He was a founding member of the Simulation Interoperability Standards Organization (SISO), where he served as Chair of SISO's Board of Directors, Chair of SISO's Conference Committee, and as a member of SISO's Executive Committee. From 2001-2012, he was SISO's Executive Director. In this presentation, Dr. Miller provides a unique perspective on how distributed simulation was conceived and developed, including major milestones, tests, and demonstrations. He offers anecdotes and insights regarding key events and individuals, as well as

	comments on subsequent developments. Key quotes from “SIMNET and Beyond: A History of the Development of Distributed Simulation”: “The core concept of SIMNET was the networking of multiple simulators, with each simulator providing its own controls, displays, and computational resources. No central control system scheduled events or resolved interactions among the simulation nodes. Instead, each node was autonomous, maintaining authoritative status for one simulated entity (e.g., a tank, helicopter, or missile system) and transmitting messages about the state and actions of its simulated entity to other nodes on a peer-to-peer basis. Each node was also responsible for receiving, interpreting, and responding to messages regarding events that might affect its own entity (e.g., a missile impact, an exploding mine, a collision, etc.) and for reporting any resulting changes in its entity’s state (e.g., damaged, destroyed, or unaffected.)” “In 1985, the Undersecretary of the Army agreed to redirect funding to DARPA to support SIMNET development, “Because if you can do what you’re telling me, it will change the way the Army manages its weapon systems procurement.” And in many respects, it has. In 1991, a study of various DARPA initiatives by the Potomac Institute for Policy Studies listed SIMNET as one of six programs that have had the most profound effects on the DoD.” “The SIMNET protocols were the foundation for the Distributed Interactive Simulation (DIS) protocols, which were used for the Army’s Close Combat Tactical Trainer (CCTT), Aviation Combined Arms Tactical Trainer (AVCATT), and subsequent procurements. DIS, in turn, was a primary source for the High Level Architecture (HLA).”



2017
Hank Okraski

Henry C. “Hank” Okraski served 32 years as a government engineer/manager/executive. As a Senior Executive, he was the Director of Research and Engineering, Deputy Technical Director and Chief Scientist at the Naval Air Warfare Center Training Systems Division. He is a founding member of the National Center for Simulation (NCS) and was inducted into the NCS M&S Hall of Fame in 2014. He developed and implemented a high school curriculum and the nation’s first certification in Modeling and Simulation (M&S) for high school and technical school students. He was selected Federal Engineer of the Year by the National Society of Professional Engineers. Mr. Okraski has a bachelors degree in electrical engineering from Clarkson University and a masters degree in systems engineering from the University of Florida, and is the author of “The Wonderful World of Simulation.”

As the 2017 I/ITSEC Fellow, Mr. Okraski takes readers on a journey of his experiences and education in the simulation and training world, both as a member of industry and as a Government employee. Throughout this journey, he informs readers of the important lessons learned, giving an outstanding insight into how this industry has evolved throughout his lifetime.

Key quotes from “Remembrances of a Simulationist: An Exciting Career of ‘Make Believe’” “The importance of synthetic training was recognized in 1934 by the U.S. Army Air Corps, when they assumed the responsibility for air mail delivery. When visibility was poor, pilots would have to rely on instruments and the current cadre of about 100 pilots were illequipped to fly by instruments alone. Several of the military aircraft crashed in bad weather. An emergency appropriation of funds was approved by Congress and the President. The first 6 Link Trainers were delivered and a new industry was born (Kelly).”

“The base facilities were old, built in the 1940’s for the Army Air Corps, and many buildings were without reliable air conditioning. Orlando was a small town in the orange groves at the time, before the Disney presence, with few technology firms in the area. The

	Martin Company was the only major contractor in Central Florida and was primarily in the missiles business. The company had a simple helicopter trainer, a testbed for research with a giant model board used for cockpit visual display experiments. The politics leading to the decision to move the approximately 1,100 Navy and Army personnel from Long Island to Orlando was intense and complex but that decision led to the creation of a national asset 'The Center for Modeling & Simulation' in Central Florida." "We moved to special-purpose computers that were expensive, some using machine language and difficult to program. Then came FORTRAN and multi-purpose computers that facilitated software development and modifications. The DoD language of choice became ADA, causing our industry to 're-tool' software development. In spite of the entire industry, including the commercial computer developers, moving to C Plus and C Plus Plus, DoD stood steadfast on ADA as the software requirement. This was costly and really unnecessary."
 **2018** **Dr. S.K. Numrich**	Susan K. Numrich (Sue), Ph.D., CMSP, has contributed to the science and technology of Modeling and Simulation for over 50 years. Sue dug right in as a Research Physicist at the U.S. Naval Research Laboratory (NRL) following receipt of her AB in Physics from Trinity College. As is typical for a researcher, she began her career at the engineering level of modeling and simulation and moved gradually into parallel and distributed simulation. She was fortunate to have support from NRL to pursue graduate work at The Johns Hopkins University, American University and Cambridge University (UK). She was selected by NRL and their parent organization, the Office of Naval Research, to represent the Science and Technology (S&T) community as part of the Navy's Modeling and Simulation Management Office, a position that broadened her knowledge base to simulation used for training, acquisition, analysis and support to operations. When The Technical Cooperation Program (US, UK, CA, AUS, NZ) decided

to explore distributed simulation as an area of international interest, Sue was selected to lead the development from a study group to a permanent committee, an effort for which she received both Project and Individual Performance Awards. When NATO chose to add simulation to their Studies and Analysis group, Sue joined as the U.S. representative for simulation, a position she held for a three-year term. Meanwhile, back at the laboratory, she assumed leadership of a Branch where she managed programs in virtual reality, distributed simulation, massively parallel processing, signal processing and mission planning systems. Her last three years as a civil servant, Sue served as the Director of Technology for the Defense Modeling and Simulation Office where she was exposed to simulation across the entire Department of Defense. Since 2005, she has been a research staff member at the Institute for Defense Analyses where she has contributed to studies in the use of military simulation, the incorporation of human activity and behavior into various types and levels of simulation, and the validation of a variety of simulations. Sue joined the I/ITSEC community in Emerging Concepts and Innovative Technologies. She founded and was the first chair of the Tutorial Board, now a staple of I/ITSEC week, offering introductory through advanced tutorials on a wide variety of relevant topics to help educate members of the Modeling, Simulation and Training community. Along the way Sue accepted an Office of the Secretary of Defense Exceptional Civilian Service Award, received a patent, became a Fellow of the Acoustical Society of America and a Jackson Fellow of the Council for Excellence in Government, wrote four book chapters and more than 50 technical papers, and served in two Academic appointments spanning twenty years.

2018 I/ITSEC Fellow, Sue Numrich, Ph.D., embraced the Fellow's presentation as an opportunity to create a retrospective, but one that might point to the future. She focused on merging two ideas. First, she examined forecasting. The Intelligence Advanced Research Projects Agency (IARPA) sponsored a three-year study on forecasting, pitting the "wisdom of the crowd" against other proposed techniques. The clear winner was a

	Penn/Berkeley project focused on superforecasters, indicating, surprisingly, superforecasters can be developed. Second, she examined lessons unlearned. We talk all the time about lessons learned and even create organizations to gather and publish them. When we truly learn a lesson, we incorporate it into our practices to advance our knowledge and capability and improve our simulation products. However, what about lessons unlearned, those things we tripped over, documented, forgot and thus tripped over again? What is their role? And what about our failures, the ones we hesitate to celebrate in papers and presentations? Is there value in them? If you would like to see these ideas come together and point to ways we may be able to grow our knowledge and capability, read the paper and attend the presentation. See examples of some lessons unlearned and how they plague us today, and perhaps find a way to leverage them to understand the future and more successfully develop future capabilities.
 **2019** **Dr. Richard Fujimoto**	Richard Fujimoto is a Regents' Professor in the School of Computational Science and Engineering at the Georgia Institute of Technology. He received a Ph.D. from the University of California at Berkeley in 1983. Prior to this, he received an M.S. degree from the same institution and two B.S. degrees from the University of Illinois at Urbana-Champaign. He has been an active researcher and educator in the parallel and distributed simulation field and has devoted his career to this subject. He has authored or co-authored hundreds of technical papers on this topic, including seven award-winning publications and three books, one devoted entirely to parallel and distributed simulation systems. He led the development of parallel and distributed simulation software systems, including the Georgia Tech Time Warp (GTW) simulation executive and the Federated Simulation Development Kit (FDK). He has given numerous keynote addresses and tutorials on parallel and distributed simulation at leading conferences. He led the definition of the time management services for the High Level Architecture for Modeling and Simulation standard (IEEE 1516). Fujimoto has served as Co-Editor-in-Chief of the journal

	Simulation: Transactions of the Society for Modeling and Simulation International, as well as a founding area editor for ACM Transactions on Modeling and Computer Simulation. He has led in the organization of many modeling and simulation conferences, notably the PADS conference over the last thirty years. He was the founding Chair of the School of Computational Science (CSE) at Georgia Tech, among the first academic units of its kind focused on the discipline concerned with computer-based models of natural and engineered systems. In this role, he led the creation of the Ph.D. and M.S. degree programs in CSE as well as two undergraduate minors. He is a recipient of the ACM Distinguished Contributions in Modeling and Simulation Award for his accomplishments in the parallel and distributed simulation field. Richard Fujimoto, Ph.D., focused his I/ITSEC Fellows paper on his personal views of the origins and development of the Parallel Discrete Event Simulation (PDES) field, as well as directions for future development. In presenting the early history of PDES, Richard tells of two distinct solutions to attack the time synchronization problem. The solutions developed were quite different since the application contexts in which they were applied dictated opposite approaches. He then discusses efforts to evaluate the performance of the competing camps, known as conservative and optimistic synchronization. Richard led the effort to define the time management services for the High Level Architecture (HLA), integrating both conservative and optimistic synchronization approaches. His legacy with this work ensures time stepped, real-time, and event-driven simulations can interoperate temporally within a federation. He concludes his paper and presentation by discussing commercialization efforts as well as future research in PDES, paying particular attention to updated computing platforms.