Curriculum Vitae
C. Robert Kenley, PhD, ESEP, INCOSE Fellow
Purdue University School of Industrial Engineering
Phone: +1 765 494 5160
E-mail: kenley@purdue.edu

EDUCATION

Ph.D., Engineering-Economic Systems (EES), Stanford University	June 1986
M.S., EES, Stanford University	January 1984
M.S., Statistics, Purdue University	August 1979
S.B., Management, Massachusetts Institute of Technology	June 1975

PROFESSIONAL EXPERIENCE

7/21 – present PURDUE UNIVERSITY
Professor of Engineering Practice, School of Industrial Engineering

Co- developed curriculum and courses for INCOSE Academic Equivalency and model-based systems engineering at Purdue. Leading and participating on thesis committees for graduate students who are applying systems engineering and analysis tools and methods.

7/14 – 7/21 PURDUE UNIVERSITY
Associate Professor of Engineering Practice, School of Industrial Engineering

Developed curriculum and taught systems classes at Purdue. Participated on team to establish Purdue Systems Collaboratory. Led and participated on thesis committees for graduate students who are applying systems engineering and analysis tools and methods.

8/12 – 7/14 PURDUE UNIVERSITY
Associate Research Scientist, Center for Integrated Systems in Aerospace

Supervised graduate students on research that applies agent-based simulation modeling and analysis to study systems of systems. Applied Bayes' net methods to characterize and model behavior of agents within a system of systems. Developed technical sections of research proposals.

11/09 – 7/12 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Research Associate, Lean Advancement Initiative

Led research projects on large-scale system design and management methods and processes. Supervised graduate students and performed research on complex sociotechnical systems that included (1) statistical methods using technology readiness levels to forecast cost and schedule for R&D activities; (2) a survey instrument for assessing the capability of an enterprise in its delivery of maintenance, repair, and operations services on existing systems; (3) benchmarking of effectiveness of risk management and lean program management practices; (4) system modeling and analysis for an enterprise analysis and architecting project that studied prevention and treatment services for

post-traumatic stress in US military service members and their families; and (5) decision analysis methods for planning tests of unmanned and autonomous systems.
Served as Director for Programs and Research ensuring the content, timeliness, and quality of research efforts. Led the preparation of technical sections of research proposals and provided peer review of the content of interim and final research results. Reviewed cost, schedule, and resources for proposals; and reviewed research progress against planned schedules and made recommendations for reallocations of funds and other resources.

8/98 – 12/15 KENLEY CONSULTING, LLC
Consultant.

For the International Council on Systems Engineering, provided services as Chief Editor of *INSIGHT*, their quarterly publication containing technical articles and general news.
For the Idaho National Lab, provided technical expertise and leadership on risk management and trade study methods for R&D planning.
For ITT Industries, developed methods for technology readiness assessment, R&D portfolio evaluation, and development cost uncertainty analysis to establish a comprehensive, integrated decision support process.
For Lockheed Martin, applied advanced Bayes net and influence diagram algorithms to missile defense target discrimination that fuses passive and active sensor data.
For Department of Energy (Bechtel SAIC), provided economics and uncertainty modeling support for the Yucca Mountain Radioactive Waste Management System. Developing appropriate methods for financial discounting and treatment of engineering cost uncertainties for a project that spans multiple generations over a period of several hundred years. Integrating programmatic and technical risk assessment into life cycle cost uncertainty modeling.
For Department of Energy (Bechtel BWXT), developed multivariate regression methodology to integrate diverse inputs data sets on job creation in the US resulting from deployment of the next generation of nuclear power plants.
For National Nuclear Security Administration, led technology readiness evaluation for Los Alamos National Laboratory Pit Disassembly and Conversion technologies to define prioritize R&D investments.
For Spectrum Astro and Lockheed Martin, provided system-of-systems requirements development, technical integration and risk management expertise for the SBIRS High and Low satellite constellations. Multiple end users are provided data that is collected from multiple electro-optical sensors and is processed and distributed using a complex network architecture.
For Department of Energy (Bechtel BWXT), developed a Mutli-Year Program Plan for R&D responding to DOE requirements for the Nuclear Materials Focus Area. Provided strategic planning decision analysis support and management support to develop and execute plans to transition excess defense nuclear materials to civilian uses such as medical isotope and advanced commercial reactor fuel production.
For Boeing North American, provided technical and management closure on

design requirements for a complex infrared data collection and data processing payload.

For Department of Energy (Bechtel SAIC), developed a system life cycle cost risk assessment methodology that combines standard cost risk Monte Carlo modeling and subjective risk assessment methods based on system cost overruns that used Defense Department major procurement historical data.

For Lockheed Martin, developed a new implementation of mixed Gaussian Bayes nets that provides numerical stability for real-time applications such as target tracking, typing, and discrimination, and incorporates deterministic models and diffuse prior information. For Department of Energy (Bechtel SAIC), developed a forecasting model that uses commercial bond forward yields for long-term inflation and interest rates. Kenley Consulting has filed for a patent on this invention.
For Department of Energy (Bechtel SAIC), integrated 55 years of economic research on long-term discounting theory to provide a cogent explanation and evaluation of the different models and provided a recommendation for the appropriate long-term discounting methodology to be applied to public infrastructure procurements.

1/99 - 3/99 Taught project management at San Jose State and probability at UC Davis (Livermore extension). These were at the upper division undergraduate / lower division graduate level.

5/95 – 8/98 LOCKHEED MARTIN IDAHO TECHNOLOGIES COMPANY
Engineering Fellow in Systems Engineering.

On loan to Lockheed Martin Missiles & Space (LMMS) in Sunnyvale, CA, I organized and managed activities to migrate the space vehicle requirements and verification responsibility from Boeing to LMMS. The accomplishments in this four-month period included review of existing documentation, preparing a credible presentation for a major program review, and laying out detailed closure plans.
At Department of Energy headquarters in Washington, DC, provided DOE Office of Science and Technology Policy with expertise in systems processes and portfolio analysis methodologies to select R&D investments. Provided systems engineering leadership for the Nuclear Materials Stabilization Task Group's Technical Advisory Panel of plutonium and uranium processing experts that evaluated programmatic risk and prioritized approximately 100 technologies offered by production sites and labs across the DOE complex for a high-priority, fast-paced nuclear waste disposal program. Presented results of the findings to DOE senior executives and the Defense Nuclear Facilities Safety Board.

Provided systems engineering leadership for the Plutonium Stabilization and Packaging System Procurement, a unique performance-based central procurement.
Developed a technology maturity and programmatic schedule risk assessment methodology that provides a quantitative ranking for progress evaluation and decision making. The process produces rankings that are correlated to the actual time remaining to achieve operational readiness. This enables operational readiness forecasting for planners and policy makers for time-critical missions. Taught systems engineering trainees in Idaho and via video-teleconferencing to retrain scientists and engineers for the future role of the Idaho National Environment and Engineering Laboratory as the "Center of Excellence" for DOE systems engineering. This training is at the upper division undergraduate / lower division graduate level.

3/89 - 4/95 LOCKHEED MISSILES & SPACE COMPANY, INC.

11/92 - 4/95 Lead, Systems Analysis. DMSP/NOAA, Space Systems Division (SSD).

Developed plan to focus Lockheed and customer activities in support of the government's acquisition decision in concert with DoD 5000 acquisition instructions. Developed operations modeling and quantitative cost-effectiveness analysis capability for a front-end systems engineering effort to define concepts for merging the Defense and Commerce low altitude environmental satellite systems into one system used advanced sensor and data processing technology. Developed original results to quantify impacts of sensor and design engineering decisions on end-user operational effectiveness.
During my tenure at Lockheed Missiles & Space, I taught systems engineering training classes on system simulation and system synthesis, and overviews of decision analysis and the systems engineering process. This training also was at the upper division undergraduate / lower division graduate level.

11/92 - 3/94 Group Lead, Communication Operations. Milstar, SSD.

Organized and recruited personnel for group to meet needs for advanced development to support previously undefined needs for a multi-billion dollar space program. Supervised on-orbit test and independent operational evaluation of the system against user needs. Developed communications satellite system operations and use concept. Project Lead for Milstar Polar Adjunct Study, which included leadership of activities as diverse as system requirements development; system, spacecraft, and ground segment design trades; subcontractor payload design; and life cycle costing.

4/91 - 11/92 Sr. Staff Engineer. FEWS, ATSSB, Brilliant Eyes, and P-477; SSD.

Led System Maturity Risk Management Plan for FEWS satellite system proposal. On P-477, performed complex signal and data processing algorithm

trades and proposal writing. Managed senior Lockheed staff and technical consultants performing applied research and communicated results to the customer and software subcontractors. Assisted Palo Alto research laboratories in defining requirements for advanced development of multi-sensor passive and active acoustic system under DARPA sponsorship.

3/89 - 4/91 Deputy to Chief Systems Engineer. Space Surveillance and Tracking System (SSTS), Astronautics Division (AD).

Assisted in direction and coordination of technical efforts of a 40-person department at Lockheed, additional system engineering staff at TRW, and design engineers at Hughes, Aerojet, TRW, and Lockheed. Chief technical responsibility was defining system performance requirements for System Design Review of the demonstration and validation satellite.
Developed multi-target tracking algorithm based on multivariate Gaussian influence diagram models.

1/88 - 3/89 Sr. Staff Engineer. TIBURON SYSTEMS, INC., San Jose, CA.

Chief Systems Engineer for submarine data processing systems. Developed simulation to define the hardware/software architecture for two submarine combat system contracts.

6/81 - 12/87 LOCKHEED MISSILES & SPACE COMPANY, INC.

1/85 - 12/87 Group Engineer / Analyst. SSTS program, AD.

Systems analysis and simulation supervisor. Integrated efforts from multiple organizations, and developed system utility versus cost trades to determine cost-effective interface solutions.

6/81 - 1/85 Research Engineer. Data Systems Engineering, SSD.

Simulation modeling for real-time distributed ground system with emphasis on designing central man-machine process control algorithms and software requirements. Design, analysis, and implementation of angles-only satellite tracking algorithm for a prototype data fusion system, mission planning algorithm development for a satellite-based radar system, and real-time tactical data systems software development.

9/80 - 6/81 Teaching Assistant. Engineering-Economic Systems (EES) Department, Stanford University.

Taught probabilistic analysis, decision analysis, advanced decision analysis, and decision analysis practice.

6/80 - 9/80 Analyst. APPLIED DECISION ANALYSIS, Menlo Park, CA.

Wrote technical appendix for final report on a National Institutes of Health R&D planning model that assessed consumer acceptance of potential cavity prevention treatment products.

8/77 - 8/79 Teaching Assistant. STATISTICS DEPARTMENT, Purdue University.

Taught calculus and statistics.

ADDITIONAL INFORMATION

3/14 – Present International Council on Systems Engineering (INCOSE) Fellow
Chair of the INCOSE Fellows Committee. (12/22 – Present)

Lifetime honor for contributions both as a practitioner in design, analysis, and risk management for developing advanced system concepts and as a researcher in applying analytic, statistical modeling, and simulation methods to all aspects of advanced systems concept development.

10/15 – Present Sigma Theta Mu
Member of the Board of Directors and Secretary.

Member of the board and corporate secretary of Sigma Theta Mu., an honor society to recognize distinguished scholarship in the study of systems or the field of systems engineering.

11/12 – Present Expert Systems Engineering Professional (ESEP)
Lifetime certification of professional capabilities at the highest level recognized by INCOSE.

7/08 – Present The Cameron Group, Inc. and spaceSMARTs
Member of the Board of Directors and Secretary of the Corporation.

Member of the board and corporate secretary of The Cameron Group, Inc., a high-technology consulting firm headquartered in Silicon Valley that provides engineering services in nuclear energy and space systems. Founding shareholder, director, and secretary of spaceSMARTs, the product development subsidiary of The Cameron Group, Inc.

6/99 – 1/11 Served as Secretary of INCOSE from 2007 to 2011. Was a member of the board and the executive committee and the chief administrative officer of the organization, managing agendas for board meetings and executive committee meetings, chairing board meetings as required, providing executive oversight of

policy development, and certifying member rosters for elections. Served as chair of Ways and Means of INCOSE from 1999 to 2007, attended all board meetings, and led them through major policy and bylaws changes to effect significant changes in the governance structure of this growing international professional society.

Various clearance held with US government organizations.

PUBLICATIONS

See https://web.ics.purdue.edu/~ckenley/My%20Publications.html