Bonnie L. Triezenberg, PhD.

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Sr. Engineer, RAND Corporation; Adjunct Professor, Loyola Marymount University

Research Interests: The Intersection of National Security, Space, Technology and Human Cognition

EXPERTISE:

Initiating and Leading Innovative and High Visibility Projects:

- I have been fortunate to contribute significantly to the advancement of autonomous systems, software architecture and the development of space systems over the course of my career.
- While working for Boeing Space and Intelligence Systems (S&IS) and the former Hughes Space and Communications (1980-2013), I led systems development for a wide variety of space vehicles, often in high visibility applications. These include the first commercial spacecraft having on-board computers; innovative advances in space situational awareness, space security, imaging, weather, and strategic, tactical and commercial communication; and the first processing payload to route the internet across space links. Towards the end of my time at Boeing, I served as Chief Engineer providing strategic vision for Boeing Phantom Work's next generation of satellites.
- While at RAND (2014-present), my innovation and experience have been leveraged to:
    - Lead the architecture, development and use of a complex game theoretic model to examine both physical and psychological aspects of deterrence of war in outer space.
    - Lead and contribute to studies to inform U.S. DoD policy and strategy regarding space, nuclear and information warfare.
    - Lead and contribute to studies that inform space domain related strategic messaging campaigns, readiness reporting, and resiliency studies.
    - Lead and contribute to studies designed to improve U.S. DoD's understanding of and competency in software development, digital engineering and AI.

Experienced teacher and coach for a diverse engineering community:

- LMU (2018-present), I teach graduate level courses in software architecture, autonomous systems and system engineering fundamentals.
- Boeing Sr. Technical Fellow, specializing in Agile System Development. Technical Fellows are executives who work collaboratively with Program Managers and teams across the company to solve hard technical challenges in physical, information and/or human centric systems. In this capacity, I worked closely with engineering teams to understand their challenges and to provide needed resources, including training. My role also required me to interface with CEOs and heads of major government programs and agencies, educating them on system and software engineering issues.
- Chief Software Engineer for Boeing Space & Intelligence Systems. Chief Engineers are responsible for the technical integrity of delivered systems and provide the final "ship product" and "go for launch" decisions for space products and other deliverables. This required me to work collaboratively across a wide range of programs and personnel throughout architecture, design, development, testing and deployment of these systems.

- Chief Engineer and Software Architect for Boeing's $12B Transformational Satellite Program for the USAF. During the proposal and initial development of $1B of software, I led a US-wide consortium across a diverse range of companies. To ensure team cohesion and the necessary skillsets to realize the software architecture, I designed and taught a "TSAT University" curriculum to approximately 100 students, meeting twice weekly over the course of a year.
- SW Engineering manager. For several years, I led ground systems and space software development for Hughes Space and Communications. In this role, I supported staff development through mentoring, conducting training classes, etc.

PUBLICATIONS:

Triezenberg, B., Langeland, K, Downing, B, (forthcoming), *Space Competition and the Dynamics of Conflict*, RR-A751-1, RAND Corporation, Santa Monica.

Triezenberg, B, Steiner, C., Johnson, G., Cham, J., Souse, E, Kim, M., Adgie, M, (2020), *Assessing the impact of U.S. Air Force national security space launch acquisition decisions*, RR-4251-AF, RAND Corporation, Santa Monica.

Robson, S, Triezenberg, B., DiNicola, S., Polley, L., Davis, J., Lytell, M. (2019), *Software Acquisition Workforce Initiative for the Department of Defense: Initial Competency Development and Preparation for Validation*; RR-3145-OSD, RAND Corporation, Santa Monica.

Paul, C., Clarke, C., Triezenberg, B., Manheim, D., Wilson, B. (2018); *Improving C2 and Situational Awareness for Operations in and through the Information Environment*; RR-2489-OSD, RAND Corporation, Santa Monica.

Weinbaum, C., Triezenberg, B., Meza, E., Luckey, D. (2018); *Understanding Government Telework, An examination of Research Literature and Practices from Government Agencies*; RR-2023-OSD, RAND Corporation, Santa Monica.

Triezenberg, B., *Deterring Space War, An Exploratory Analysis Incorporation Prospect Theory into a Game Theoretic Model of Space Warfare*, RGSD-400, Pardee RAND Graduate School, Santa Monica.

Schnaubelt, C., Cohen, R., Dunigan, M., Gentile, G., Hastings, J., Klimas, J., Marquis, J., Gereben Schaefer, A., Triezenberg, B., Zeigler, M. (2017); *Sustaining the Army's Reserve Components as an Operational Force*; RR-1495-A, RAND Corporation, Santa Monica.

Balkovich, E., Prosnitz, D., Isley, S., Boustead, A., Triezenberg, B.L. (2017); *Helping Law Enforcement Use Data from Mobile Applications, A Guide to the Prototype Mobile Information and Knowledge Ecosystem (MIKE) Tool;* RR-1482-NIJ, RAND Corporation, Santa Monica.

Graf, M, Hlavka, J.P., Triezenberg, B.L. (2017); *A Change is in the Air, Emerging Challenges for the Cloud Computing Industry*; WR-1144, RAND Corporation, Santa Monica.

Triezenberg, B., Bartels, E., Saum-Manning. L., Torrington, G., Marler, T., Langeland, K., Pita, J. (2017); *Deterring War in Outer Space: A Game Theoretic Analysis Incorporating Prospect Theory to Explore Decision Making under Uncertainty*, International Studies Association.

In addition, over the past six years I have written reports on space policy and strategy issues including strategic deterrence and messaging (2), cost modelling (1), space battle management (1), space readiness reporting (1), and commercial uses of space ISR (1). These reports are not available to the general public.

PATENTS, AWARDS and RECOGNITIONS:

- 2018 Richard E. Sherwood Memorial Award to recognize innovation and excellence in a dissertation in foreign affairs.
- 2017 Patent Awarded for "Demand Based Resource Allocation in Remote Sensing Systems"
- 2016 RAND Project Airforce Dissertation Award
- 2013 Selection as a Boeing Senior Technical Fellow
- 2012 Boeing Phantom Works Outstanding Achievement Award
- 2012 Boeing Defense Systems World Class Engineer Award for Technical Leadership
- 2009 Award in Recognition of Contributions made in support of the Transformation Satellite Proposal Effort
- 2007 Amelia Earhart Society's Barbara Clark Pioneer Award for visionary leadership
- 2002 Joint Boeing/HNS (customer) Award for Excellence in development of Hughes-Net
- 2001 Boeing Associate Technical Fellow
- 2000 Boeing Technical Excellence Team Award for work on the Wideband Gapfiller program
- 2000 Award In Recognition of Contributions Above and Beyond the Call of Duty in the Wideband Gapfiller Program
- 1993 Hughes Technical Excellence Individual Award for development of the EHF Payload Software for the UHF Follow-on system.
- 1992 Joint Hughes/US Gov't (customer) Exceptional Service Award for technical leadership of a US Government space program.
- 1989 Joint Hughes/US Gov't (customer) Excellence Worldwide Award for innovation on a US Government space program.

EDUCATION

I hold a BS degree in Aerospace Engineering from the University of Michigan and a master's degree in System Science from UCLA. From the Pardee-RAND Graduate School, I hold a master's degree and PhD in Policy Analysis. I continually look forward to new challenges.