

April 2020

Rock River Valley Section
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Event

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The Institute of Electrical and Electronic Engineers, Inc.

IEEE RRV Section, Consultants' Network Meeting

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WHEN Thursday, April 30, 2020

WHERE Webex

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Event number (access code): 598 354 927
Meeting password: RRVIEEEACNMTG

AGENDA

7:00 PM Dial in
7:15 PM Introductions
7:30 PM Presentation



Analytical Probabilistic Modeling (APM) in Aerospace Human-in-the-Loop (HITL) Problems

Dr. Ephraim Suhir, Research Professor with Portland State University

Here is a significant potential for the reduction in aerospace accidents and in assuring mission success and safety through better understanding the roles that various uncertainties play in the planner's and operator's worlds of work. In this review the rationale behind the probabilistic risk analysis (PRA) incentive in aerospace human-in-the-loop (HITL) related tasks is explained, and several recently suggested PRA models are indicated and briefly discussed: convolution model, with applications to the helicopter-landing ship (HLS), the famous miracle-on-the-Hudson event and the concept of anticipation in aviation; route segmentation model, with application to an aerospace mission outcome and double-exponential-probability-distribution-function (DEPDF) model for the probability of human non-failure, with application to the roles of the human capacity factor (HCF) and mental workload (MWL). The extension part addresses the use of the simplest version of the Boltzmann-Arrhenius-Zhurkov (BAZ) equation as a possible DEPDF model in the HITL related problems. Unlike the previously suggested DEPDFs, BAZ constitutive equation has a strong physics-of-failure background. The general concept is illustrated by a numerical example. See [https://www.crcpress.com/Human-in-the-Loop-Probabilistic-Modeling-of-an-Aerospace-Mission Outcome/Suhir/p/book/9780815354550](https://www.crcpress.com/Human-in-the-Loop-Probabilistic-Modeling-of-an-Aerospace-Mission%20Outcome/Suhir/p/book/9780815354550)

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Please register online at

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or by emailing Diane Sennebogen at diane.brock@utas.uts.com by Thursday, April 30 at 1 pm. Please include the following: name, phone number, email address, and IEEE member number. The meeting is open to the general public.

Ephraim Suhir is on the faculty of the Portland State University, Portland, OR, USA, Technical University, Vienna, Austria and James Cook University, Queensland, Australia. He is also CEO of a Small Business Innovative Research (SBIR) ERS Co. in Los Altos, CA, USA, is Foreign Full Member (Academician) of the National Academy of Engineering, Ukraine (he was born in that country); Life Fellow of the Institute of Electrical and Electronics Engineers (IEEE), the American Society of Mechanical Engineers (ASME), the Society of Optical Engineers (SPIE), and the International Microelectronics and Packaging Society (IMAPS); Fellow of the American Physical Society (APS), the Institute of Physics (IoP), UK, and the Society of Plastics Engineers (SPE); and Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA). Ephraim has authored 400+ publications (patents, technical papers, book chapters, books), presented numerous keynote and invited talks worldwide, and received many professional awards, including 1996 Bell Laboratories Distinguished Member of Technical Staff (DMTS) Award (for developing effective methods for predicting the reliability of complex structures used in AT&T and Lucent Technologies products), and 2004 ASME Worcester Read Warner Medal (for outstanding contributions to the permanent literature of engineering and laying the foundation of a new discipline “Structural Analysis of Electronic Systems”). Ephraim is the third “Russian American”, after S. Timoshenko and I. Sikorsky, who received this prestigious award. He received the 2019 IEEE Electronic Packaging Society (EPS) Field award for seminal contributions to mechanical reliability engineering and modeling of electronic and photonic packages and systems and Int. Microelectronic Packaging Society’s (IMAPS) Lifetime Achievement award for making exceptional, visible, and sustained impact on the microelectronics packaging industry and technology.