



(Part 2 of 2) Some Critical Space-Safety Problems Can Be Addressed Using Mathematical Analogies Based on Probabilistic Risk Science: Prospective

Thursday, March 14, 2024, 12-1 PM PT

Location: Engineering 6 BLDG, Room 580B

Zoom: <https://ucla.zoom.us/j/94778587870>

Abstract

An analogy with the recently suggested probabilistic interpretation of the Fitts' law in the theory of human-computer interactions (HCI) is employed in this analysis to assess the likelihood that a Tunguska type meteorite hits Earth. Two extreme cases are considered: 1) a big asteroid travels within the solar system still far away from Earth (the probabilistic Fitts' law reduces in such a situation to the well-known exponential law of reliability) and 2) the asteroid has become a meteorite and is approaching Earth (the complete double-exponential probabilistic Fitts' law is employed in such a case). The addressed analogy can be used, in addition to other efforts, to design, conduct and interpret an inexpensive, but, of course, highly tentative HCI-theory-based imitation viewed as analogous to the vital space safety related problem.

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Ephraim Suhir is on the faculty of the Portland State University, Portland, OR, USA, and Bordeaux Univ., France. He is also CEO of a Small Business Innovative Research (SBIR) ERS Co. in Los Altos, CA, USA, is Foreign Full Member 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 500+ publications, presented numerous plenary, keynote, invited and contributed talks and taught continued education courses worldwide. He received many professional awards, including 1996 Bell Labs. 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"). He is the third "Russian American", after S. Timoshenko and I. Sikorsky, who received this prestigious award.

Ephraim's most recent awards are 2023 SHEN "International Research Award on Science, Health and Engineering for the paper "Probabilistic Fitts' Law and the Likelihood of the Tunguska Type of Event, Journal of Space Safety Engineering, 10(1), March 2023", 2019 IEEE Electronic Packaging Society (EPS) Field award (for seminal contributions to mechanical reliability engineering and modeling of electronic and photonic packages and systems); 2019 IMAPS Lifetime Achievement award (for making exceptional, visible, and sustained impact on the microelectronics packaging industry and technology) and 2022 IEEE SCV Section Outstanding Engineer award (for seminal contributions to several critical IEEE fields, including probabilistic design-for-reliability of microelectronic and photonic materials, devices and systems, and the role of the human factor).