

Join our Next Webinar!

Caleb King, Research Statistician Developer at JMP, will be giving the following talk on March 29, 2023 at 10:30am EST. [Click here to register for the webinar.](#)



The Statistical Engineering Framework: What It Is and How It Works in Practice

In this talk, I'll be giving a description of the Statistical Engineering (SE) Framework. The first part of the talk is based on the finding of a working group of several members of ISEA. This working group was assigned the task of determining the root causes of confusion surrounding the perception of SE and ISEA. One of the key findings of that group was that much of the confusion involved misperceptions around the SE Framework. In the second part of the talk, I'll illustrate an appropriate use of the framework with a case study in statistical software testing.

Note that if you want watch any of our *past* webinars, you can do so on the [ISEA YouTube Channel](#).

Website Revitalization

Last month we announced ISEA's plans to improve its website (<https://isea-change.org/>), with the intention of making it easier to navigate, comprehend, and more helpfully provide information and resources on Statistical Engineering. At this point we would like to formally solicit your feedback on the website. Please take this short survey to tell us what you think about the current website and what you'd like to get out of the new one. [Click here to take the survey.](#)

Upcoming Conferences and Conference Sessions of Interest



The 2023 DATAWorks Defense and Aerospace Test and Analysis Workshop is happening April 25-27, 2023 in Alexandria, Virginia, USA. Registration is open now and closes April 14. See the conference website for more details: <https://dataworks.testscience.org/>. Peter Parker (NASA) has organized a Statistical Engineering session at this conference featuring statisticians as well as acousticians: *A Statistical Engineering Case Study in NASA's Qesst Mission Exploring Commercial Supersonic Flight*. The details of the talks in this session are included below.

An Overview of the NASA Quesst Community Test Campaign with the X-59 Aircraft

Jonathan Rathsam

In its mission to expand knowledge and improve aviation, NASA conducts research to address sonic boom noise, the prime barrier to overland supersonic flight. For half a century civilian aircraft have been required to fly slower than the speed of sound when over land to prevent sonic boom disturbances to communities under the flight path. However, lower noise levels may be achieved via new aircraft shaping techniques that reduce the merging of shockwaves generated during supersonic flight. As part of its Quesst mission, NASA is building a piloted, experimental aircraft called the X-59 to demonstrate low noise supersonic flight. After initial flight testing to ensure the aircraft performs as designed, NASA will begin a national campaign of community overflight tests to collect data on how people perceive the sounds from this new design. The data collected will support national and international noise regulators' efforts as they consider new standards that would allow supersonic flight over land at low noise levels. This presentation provides an overview of the community test campaign, including the scope, key objectives, stakeholders, and challenges.

Dose-Response Data Considerations for the NASA Quesst Community Test Campaign

Aaron B. Vaughn and William J. Doebler

Key outcomes for NASA's Quesst mission are noise dose and perceptual response data to inform regulators on their decisions regarding noise certification standards for the future of overland commercial supersonic flight. Dose-response curves are commonly utilized in community noise studies to describe the annoyance of a community to a particular noise source. The X-59 aircraft utilizes shaped-boom technology to demonstrate low noise supersonic flight. For X-59 community studies, the sound level from X-59 overflights constitutes the dose, while the response is an annoyance rating selected from a verbal scale, e.g., "slightly annoyed" and "very annoyed." Dose-response data will be collected from individual flyovers (single event dose) and an overall response to the accumulation of single events at the end of the day (cumulative dose). There are quantifiable sources of error in the noise dose due to uncertainty in microphone measurements of the sonic thumps and uncertainty in predicted noise levels at survey participant locations. Assessing and accounting for error in the noise dose is essential to obtain an accurate dose-response model. There is also a potential for error in the perceptual response. This error is due to the ability of participants to provide their response in a timely manner and participant fatigue after responding to up to one hundred surveys over the course of a month. This talk outlines various challenges in estimating noise dose and perceptual response and the methods considered in preparation for X-59 community tests.

Infusing Statistical Thinking into the NASA Quesst Community Test Campaign

Nathan B. Cruze and Kathryn M. Ballard

Statistical thinking permeates many important decisions as NASA plans its Quesst mission, which will culminate in a series of community overflights using the X-59 aircraft to demonstrate low-noise supersonic flight. Month-long longitudinal surveys will be deployed to assess human perception and annoyance to this new acoustic phenomenon. NASA works with a large contractor team to develop systems and methodologies to estimate noise doses, to test and field socio-acoustic surveys, and to study the relationship between the two quantities, dose and response, through appropriate choices of statistical models. This latter dose-response relationship will serve as an important tool as national and international noise regulators debate whether overland supersonic flights could be permitted once again within permissible noise limits. In this presentation we highlight several areas where statistical thinking has come into play, including issues of sampling, classification and data fusion, and analysis of longitudinal survey data that are subject to rare events and the consequences of measurement error. We note several operational constraints that shape the appeal or feasibility of some decisions on statistical approaches, and we identify several important remaining questions to be addressed.

Announcements from Friends of ISEA!



The International Society for Business and Industrial Statistics (ISBIS) invites you to its 2023 conference, a satellite event to the 64th ISI World Statistics Congress. This 1.5-day satellite conference will be held on July 13-14 at Brock University (in St. Catharines, Canada) in advance of the WSC. Abstract submission is now open and will close March 15. See the conference website for more details: <https://brocku.ca/mathematics-science/isbis-2023/>.



The 2023 ENBIS Spring Meeting is happening May 25-26, 2023 in Copenhagen, Denmark and the conference theme is Digital Twins. Abstract submission is now open and will close April 7. See the conference website for more details: <https://conferences.enbis.org/event/35/>.



The ENBIS 2023 Conference is happening September 10-15, 2023 in Valencia, Spain. Abstract submission is now open and will close April 30. See the conference website for more details: <https://conferences.enbis.org/event/32/>.

Volunteers Needed – Help us Grow ISEA!

Are you a fan of Statistical Engineering and do you have a few hours to spare this year? Then please join us as a committee member. We have vacancies on several committees (website, webinar, conferences, and more) and we're looking to fill these roles with interested ISEA members. Please reach out to Nathaniel Stevens at nstevens@uwaterloo.ca. We would love your help even if it is just for a few hours.