IOWA STATE UNIVERSITY
Center for Nondestructive Evaluation

CNDE Webinar Presentation
February 15, 2024 - 10:00 a.m. CST

This webinar will be recorded and made available on the CNDE website

Probability of Detection: Research Advances for Continuous Signal-Responses

Presented by: Christine Knott, PhD.
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Abstract:
Probability of Detection (POD) is a valuable tool for evaluating the reliability of a nondestructive inspection system. This webinar will present a general overview of POD as used by the USAF, followed by a discussion of some recent research accomplishments. The August 2021 CNDE webinar focused on research developments for hit/miss data (detect/no-detect), but this presentation will focus on two areas of research development for ahat-vs-a data (continuous signal-responses): 1. higher-order POD modeling, and 2. POD for Dependent Observations using a Repeated Measures Method (RMM). Higher-order POD models add important variables beyond “flaw size” and considers how the area of a flaw could be modelled. The RMM is a new mathematical approach for performing POD where the observations are dependent, like in the case of continuous observations from a Structural Health Monitoring (SHM) system.

Speaker:
Christine E. Knott is a Research Mathematician in the Material State Awareness branch of the U.S. Air Force Research Laboratory’s Materials and Manufacturing Directorate (AFRL/RX). She uses statistical models to validate nondestructive inspection systems which are used to find defects in aircraft structural and engine components, and her research focuses on Modern Methods for Probability of Detection. She earned her PhD. and M.S. in Applied Mathematics at the Air Force Institute of Technology. Dr. Knott started her federal government career in 2010 at the FAA performing test and evaluation for the ADS-B system, followed by six years as a data analyst at NASIC, and then joining AFRL in 2016. She is a member of the American Society for Nondestructive Testing (ASNT) and the American Statistical Association (ASA).

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