MAP15

COMBINING QUEUEING THEORY AND OPTIMIZATION IN A NOVEL RESOURCE ALLOCATION DECISION SUPPORT TOOL FOR U.S. CUSTOMS AND BORDER PROTECTION

Julianna Puccio, Casey Perkins, Robert Brigantic
Pacific Northwest National Laboratory, Richland, Washington, USA

Abstract

The Laboratories and Scientific Services (LSS) Directorate is the scientific, technical, and forensic arm of Customs and Border Protection (CBP). Customs and Border Protection Laboratory Scientific Services (CBP-LSS) analyzes and reports on thousands of digital devices, drug, trade, and latent print samples seized each year at numerous POEs and mail facilities around the United States. Pacific Northwest National Laboratory (PNNL) researchers created a decision-support resource allocation tool that uniquely combines queuing theory and optimization to generate optimal resource allocations across the CBP-LSS main laboratories based on the arrival and completion rates of samples derived from CBP-LSS Laboratory Information Network (LIN) data. The CBP-LSS Resource Allocation Tool can help CBP-LSS answer what-if questions such as: What is the probability that an incoming sample will exceed the user-defined threshold? What is the expected lead time of an incoming sample? If the demand changes at a lab, how does that impact lead time and resource allocation?

Conference Track

Military Applications