



RECENT ADVANCES IN AI FOR NATIONAL SECURITY

Classifier Zero – Alexandra Van Dine

Poster Abstract

Classifier Zero is a concurrent labeling and learning approach that enables new classes to be instantiated when there is data support. This system would start with no prior information and sequentially cluster incoming data, presenting identified clusters to a subject matter expert for a human-understandable cluster label. Once clusters are labeled, unsupervised clustering algorithms are executed on the labeled clusters until subclasses are observed, at which point the subject matter expert is asked for a refined set of labels. It is specifically aimed at DoD surveillance mission applications, in which a perpetually vigilant sensor network should adapt dynamically due to the emergence of new threat classes and/or evolution of existing classes, and also learn refined distinctions between subclasses.

About the Author(s)

Alexandra Van Dine is a technical staff member in the Advanced Undersea Systems and Technology Group at MIT Lincoln Laboratory. In this role, she has applied artificial intelligence and machine-learning techniques in the development of maritime and undersea algorithms applied to acoustic signature classification, anomaly detection, oceanographic forecasting, data segmentation, and automatic signal generation. Alexandra holds MS and PhD degrees in mechanical engineering from the University of California San Diego as well as a BS from the University of Virginia in aerospace engineering with an emphasis on applied mathematics.

For more information, please contact raains@ll.mit.edu

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