1163-57-1071 **Colin C. Olson*** (colin.olson@nrl.navy.mil), 4555 Overlook Ave. SW, Washington, DC 20375. *Spatial-Spectral Data and Unsupervised Autoencoder Training for Hyperspectral Anomaly Detection.*

We discuss a new method for training an autoencoder (AE) as an unsupervised hyperspectral anomaly detector that leverages a percentile loss that can be defined to reliably construct an accurate background manifold model while limiting the erroneous inclusion of anomalous data. We describe the sampling theoretic considerations that drive loss function design and additionally improve detection performance and reliability by exploiting a novel cumulative detection score that incorporates statistics calculated from the ensemble of AE models generated over the history of the training process. We have previously considered only the spectral information present in a hyperspectral pixel at a given spatial location, that is, each datum as a one-dimensional spectral vector. Here we show improvements in detection performance by extending each datum to include spatial information present in a local neighborhood as long as the loss function is properly modified. We show improved detection performance on two data sets relative to the original algorithm, a graph-learning method, and a baseline algorithm that looks for deviations relative to an assumed statistical model. (Received September 15, 2020)