Deep One-Class Classification

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Abstract: In this paper In this paper we have discussed a new anomaly detection method—Deep Support Vector Data Description.

I. INTRODUCTION

Our method, Deep Support Vector Data Description (Deep SVDD), trains a neural network while minimizing the volume of a hypersphere that encloses the network representations of the data Minimizing the volume of the hypersphere forces the network to extract the common factors of variation since the network must closely map the data points to the center of the sphere.

With Deep SVDD, we build on the kernel-based SVDD and minimum volume estimation by finding a data-enclosing hypersphere of smallest size. However, with Deep SVDD Deep One-Class Classification we learn useful feature representations of the data together with the one-class classification objective. To do this we employ a neural network that is jointly trained to map the data into a hypersphere of minimum volume.

II. RESULTS
A. MNIST Dataset:

ROC AUC Score: 99.52