



Executive Summary  
**GAN Augmented Text Anomaly Detection Method**

**Innovation**

The invention relates to identifying anomalous data, including malicious text data that can be embedded in text documents, based on a certain set of measures. The invention is a framework for anomaly detection that incorporates a deep multi-layer neural network for data augmentation and classification, which improves at recognizing anomalous data with experience. The anomalous data may be detected from among any type of data collection, but the invention is especially useful for detecting text anomalies. Accordingly, a method for detection of data anomalies is provided via a deep multi-layer neural network architecture, the method being implemented by a computer system that comprises one or more processors executing computer program instructions that, when executed, perform the following steps: the neural network training phase, the autoencoder training phase, and the data anomaly detection phase.

**Market Need**

Generative adversarial networks (GAN) are a class of machine learning frameworks in which two neural networks contest with each other in a zero-sum game, where one agent's gain is another agent's loss. GANs are superior to other generative models like autoencoders or variational autoencoder in producing realistic data. The problem of applying GAN networks to anomaly detection is attracting increasing interest. The global neural network software market was estimated at \$8.30 billion in 2020 and projected to increase at a rapid rate of 35% to \$50.66 billion in 2026. The innovation addresses current market needs by providing enhanced stability, quality, and classification of detected outliers to GAN neural networks.

**Intellectual Property**

Morgan State filed a non-provisional U.S. Patent Application in December 2021.

**Stage of Development**

The method has been tested with model datasets containing movies and new group documents, which has yielded the results which confirmed: 1) the approach's effectiveness in detecting outliers; 2) strong performance; and 3) a high ratio of true positives vs. false positives, indicating good quality classifications.

**Technology Transfer Opportunity**

This innovation is one of multiple technologies available for licensing to commercial entities in the rapidly growing cybersecurity sphere. More specifically, GAN neural networks are growing in demand, and this novel method would increase effectiveness in protection against anomalies.

**Key Investigators:**

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**Field(s) of Use:**

- Cybersecurity
- Computer Engineering

**Key Words:**

- GAN neural networks
- Anomaly
- Detection
- Data

**Advantages:**

- Produces more stability in training
- Improvement in quality of generated samples
- Regularization effect on its discriminator
- Adapts to detected outliers by defining a new class.

**Status:**

Non-provisional patent application filed in 2021.

**Links:**

- [Inventor Bio](#)
- [Non-Provisional Patent Application](#)

**Reference Number:**

099/2020

**Tech Transfer Contact:**

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