Title	Author	Aim	Approach	Datasets	Shortcomings	Future Work
ADTCD: An Adaptive Anomaly Detection Approach Towards Concept-Drift in IoT	Lijuan Xu, Xiao Ding, Haipeng Peng, Dawei Zhao, Xin Li	The paper introduces ADTCD, an Adaptive Anomaly Detection Approach for IoT, aimed at addressing concept drift. It aims to dynamically adapt to changing data patterns for effective anomaly detection.	ADTCD proposes an adaptive anomaly detection algorithm for IoT, autonomously monitoring data streams, detecting concept drift, and adjusting the model. It likely employs machine learning, continuous learning, and model updating to enhance anomaly detection's robustness in IoT systems facing concept drift challenges.	INSECTS-Abr INSECTS-Inc INSECTS-IncGrd INSECTS-IncRec SWAT WADI BATADAL	The paper's limitations include a homogeneous industrial control scenario, potentially limiting generalizability, and scant focus on abnormal data due to its scarcity, hindering anomaly detection effectiveness.	Explore self-supervised learning to tackle anomaly label scarcity. Extend ADTCD beyond autoencoder-based models. Improve decision-making by building diverse anomaly detectors.
Deep learning for anomaly detection in multivariate time series: Approaches, applications, and challenges	Gen Li, Jason J Jung	The paper aims to review deep learning methods for anomaly detection in multivariate time series data, covering techniques, applications, and challenges to advance research in this field.	The paper reviews deep learning methods for anomaly detection in multivariate time series, discussing models, architectures, effectiveness, applications, limitations, and future research directions in 30 words.	Various signal dataset, Yahoo dataset , Fall detection dataset	The paper lacks empirical validation across domains. Scalability issues arise in deep learning anomaly detection for large datasets. Interpretability challenges hinder understanding of detected anomalies.	Future research aims to establish benchmark datasets for evaluating deep learning in time series anomaly detection. Explainable AI models are crucial for interpretation. Domain-specific applications offer tailored solutions.
A comprehensive survey of anomaly detection algorithms	Durgesh Samariya, Amit Thakkar	The aim of the paper is to provide a comprehensive survey of anomaly detection algorithms. It seeks to review and categorize existing approaches to anomaly detection across various domains, highlighting their strengths, weaknesses, and applications.	The paper conducts an extensive literature review on anomaly detection algorithms, categorizing methods into statistical, machine learning, deep learning, ensemble, and time-series-specific approaches. It likely provides detailed insights into each method's principles, strengths, limitations, and applications.	Not Provided	The paper's limitations include potential gaps in coverage of anomaly detection methods and a lack of empirical evaluations, as it is a survey rather than an empirical study.	Expanding the paper to cover recent anomaly detection developments ensures relevance. Including diverse domain case studies offers practical insights. Enhanced comparative analyses empower decision-making, enriching the survey for researchers and practitioners.
Concept Drift Adaptation Methods under the Deep Learning Framework: A Literature Review	Qiuyan Xiang, Lingling Zi, Xin Cong, Yan Wang	The paper reviews concept drift adaptation in deep learning, aiming to summarize current techniques and provide insights for addressing drift.	The paper conducts a thorough literature review on methods for adapting deep learning models to concept drift, summarizing approaches, strengths, weaknesses, and applications across domains.	KDD CUP 1999, Weather, Spam, and CoverType	The review may lack coverage of all concept drift methods, lack empirical evaluation for some methods, and could be biased, affecting overall conclusions.	Future research could validate concept drift adaptation methods through experiments, develop new techniques addressing limitations, and evaluate methods across diverse domains for robustness.
DiEvD: Disruptive Event Detection from Dynamic Datastreams using Continual Machine Learning: A Case Study with Twitter	Aditi Seetha, Satyendra Singh Chouhan, Emmanuel S Pilli, Vaskar Raychoudhury	The aim of the paper is to propose a methodology called DiEvD for detecting disruptive events from dynamic datastreams, focusing on Twitter data. The goal is to develop a continual machine learning approach capable of detecting and adapting to changes in real-time data streams, particularly in the context of social media platforms like Twitter.	The approach utilizes continual machine learning to detect disruptive events from dynamic datastreams, focusing on real-time adaptation to changes in Twitter data for identifying impactful events.	DET and nDET Dataset, Twitter Dataset, Event2012	Dataset Specificity: Since the paper focuses on a case study with Twitter data, one potential limitation could be the specificity of the dataset used. This may limit the generalizability of the findings to other types of dynamic datastreams beyond social media platforms.	Future research could extend the proposed methodology beyond Twitter to diverse dynamic data streams like news feeds, sensor data, or financial markets. Continual machine learning techniques can be refined for improved disruptive event detection, exploring new algorithms, strategies, or architectures.
Look At Me, No Replay! SurpriseNet: Anomaly Detection Inspired Class Incremental Learning	Anton Lee, Yaqian Zhang, Heitor Murilo Gomes, Albert Bifet, Bernhard Pfahringer	The paper introduces SurpriseNet, aiming for efficient class incremental learning inspired by anomaly detection, enabling learning new classes without replaying past data, enhancing adaptability.	The approach integrates anomaly detection techniques to handle class incremental learning challenges. SurpriseNet likely uses neural networks to adapt to new classes while mitigating retraining needs and addressing concept drift.	S-DSADS S-PAMAP2 S-FMNIST S-CIFAR10 S-CIFAR100	The review assesses scalability, generalization, robustness, and evaluation comprehensiveness of concept drift adaptation methods, crucial for their applicability across diverse datasets and domains.	The paper aims to extend the method to diverse domains, enhance efficiency for large-scale data, and address concept drift in incremental learning.
Continual Learning with Pre-Trained Models: A Survey	Da-Wei Zhou, Hai-Long Sun, Jingyi Ning, Han-Jia Ye, De-Chuan Zhan	The paper surveys continual learning methods using pre-trained models, facilitating adaptation to new tasks or domains without extensive retraining, summarizing approaches, challenges, and trends in this field.	The paper reviews continual learning techniques with pre-trained models, encompassing methodologies like fine-tuning, transfer learning, and feature extraction, analyzing their effectiveness, scalability, and applicability across domains.	CIFAR B0 Inc5, CUB B0 Inc10, IN-R B0 Inc5, IN-A B0 Inc20, ObjNet B0 Inc10, OmniBench B0 Inc30, VTAB B0 Inc10	Insufficient discussion on practical challenges or real-world deployment issues. Lack of comparison or evaluation metrics for the surveyed methods.	Future research could develop continual learning methods to mitigate catastrophic forgetting. Standardized benchmarks and evaluation protocols are essential for fair comparison and reproducibility across datasets.
A comprehensive survey of continual learning: Theory, method and application	Liyuan Wang, Xingxing Zhang, Hang Su, Jun Zhu	The paper aims to offer a thorough survey of continual learning, covering theory, methodologies, and applications. It seeks to understand and address challenges, solutions, and diverse domain applications.	The paper systematically reviews literature on continual learning, analyzing theoretical frameworks, methodologies, algorithms, and applications. It categorizes approaches, identifies challenges, and discusses advancements in the field.	Not Provided	The paper may exhibit coverage bias, lacking inclusivity of all continual learning research, potentially providing a shallow overview due to the broad topic and focusing on specific subdomains.	Future research may explore meta-learning, generative modeling, and attention mechanisms in continual learning. Cross-domain applications across computer vision, NLP, and robotics are suggested, along with standardized evaluation metrics develop

A wholistic view of continual learning with deep neural networks: Forgotten lessons and the bridge to active and open world learning	Martin Mundt, Yongwon Hong, Iuliia Pliushch, Visvanathan Ramesh	The paper aims to explore continual learning in deep neural networks, addressing challenges, lessons, and gaps between continual and active/open-world learning, proposing bridging approaches.	The paper comprehensively reviews continual learning in deep neural networks, analyzing methodologies, challenges, and proposed solutions. It offers insights into addressing complexities and may introduce new frameworks.	Not Provided	Addressing Catastrophic Forgetting: Future research could focus on developing continual learning methods that mitigate catastrophic forgetting, a common challenge where models forget previously learned tasks when trained on new ones.	Empirical validation on benchmark datasets and real-world applications, exploration of novel methodologies for addressing challenges like scalability, and interdisciplinary collaboration to integrate continual learning with related fields.
A comprehensive survey on design and application of autoencoder in deep learning	Pengzhi Li, Yan Pei, Jianqiang Li	This paper aims to offer a comprehensive overview of autoencoder design and its applications within the realm of deep learning.	Conducting an exhaustive review of existing literature, the paper thoroughly examines diverse architectures and utilization scenarios of autoencoders in deep learning.	Not Provided	While comprehensive, the survey may lack depth in certain niche applications or recent advancements, given the rapid evolution of deep learning research.	Future investigations could delve into the development of novel autoencoder architectures tailored to specific tasks and evaluate their efficacy in real-world applications spanning various domains.
Autoencoders and their applications in machine learning: a survey	Kamal Berahmand, Fatemeh Daneshfar, Elaheh Sadat Salehi, Yuefeng Li, Yue Xu	To provide a comprehensive survey of autoencoders and their diverse applications in machine learning.	Conducted a thorough review of literature to discuss various types of autoencoders, their architectures, and applications across different domains.	Not Provided	The survey lacks detailed analysis on the performance comparison of different autoencoder architectures and may overlook recent advancements in the field.	Future research could focus on conducting empirical studies to compare the effectiveness of various autoencoder architectures on different datasets and exploring novel applications of autoencoders in emerging domains.
An adversarial contrastive autoencoder for robust multivariate time series anomaly detection	Jiahao Yu, Xin Gao, Feng Zhai, Baofeng Li, Bing Xue, Shiyuan Fu, Lingli Chen, Zhihang Meng	This study aims to create a robust anomaly detection approach for multivariate time series data by combining adversarial training and contrastive learning.	The proposed method employs an adversarial contrastive autoencoder framework to establish a latent representation space that effectively separates normal and anomalous patterns. Adversarial training is utilized to boost the discriminative capabilities of the learned representations, while contrastive learning encourages compactness within classes and separability between them.	SWaT, SMD, PSM, MSL, SMAP	The method may face challenges when dealing with highly imbalanced datasets or rare anomaly occurrences. Moreover, its training process could demand considerable computational resources due to the complexity of the adversarial and contrastive objectives.	Subsequent investigations could concentrate on mitigating imbalanced dataset issues by employing techniques like data augmentation or specialized loss functions. Additionally, exploring the scalability of the method to larger datasets and real-time applications would enhance its practical applicability.
RAMFAE: a novel unsupervised visual anomaly detection method based on autoencoder	Zhongju Sun, Jian Wang, Yakun Li	To propose a novel unsupervised method, RAMFAE, for detecting anomalies in visual data using autoencoder architecture.	RAMFAE employs an autoencoder framework to reconstruct normal data, leveraging reconstruction errors to identify anomalies without labeled training data.	MNIST	RAMFAE's performance might degrade with complex datasets or varying anomaly types due to its reliance on reconstruction errors, potentially leading to false positives or negatives.	Enhancing RAMFAE's robustness to diverse anomalies by integrating additional features or refining the autoencoder architecture, and exploring its applicability across different domains with larger datasets for validation.
Financial Fraud: A Review of Anomaly Detection Techniques and Recent Advances	Waleed Hilal, S. Andrew Gadsden, John Yawney	This paper aims to comprehensively review anomaly detection techniques for financial fraud, highlighting recent advances and their applicability.	Through a systematic literature review, the paper consolidates various anomaly detection methods in financial fraud detection, emphasizing recent advancements and their effectiveness.	Not Provided	Despite the advancements, some techniques may lack scalability or struggle with real-time detection, and others may have limitations in detecting sophisticated fraudulent activities.	Future research could focus on enhancing the scalability and real-time capabilities of existing techniques, integrating multiple approaches for improved accuracy, and addressing emerging challenges posed by evolving fraudulent strategies.
Detection of Anomalies in Large Scale Accounting Data Using Deep Autoencoder Networks	Marco Schreyer, Timur Sattarov, Damian Borth, Andreas Dengel, Bernd Reimer	To develop a method for detecting anomalies in large-scale accounting data using deep autoencoder networks.	Utilized deep autoencoder networks to learn features from accounting data and detect anomalies by reconstructing normal data patterns.	SAP ERP	Limited exploration of interpretability of detected anomalies, potential challenges in scalability to extremely large datasets, and sensitivity to hyperparameter tuning.	Investigate methods to enhance interpretability of detected anomalies, optimize the scalability of the approach for handling extremely large datasets, and explore novel techniques for automated hyperparameter tuning.