



Evolving Embedding Framework for Novelty Detection

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Outline

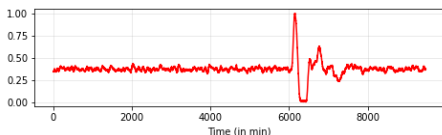
- 1 Introduction
- 2 EvolveNet
- 3 Preliminary Results
- 4 Current State

Introduction

- Real problems:
 - Detecting fraudulent use of credit cards
 - Data interoperability in IoT environments
 - Detecting and diagnosing faults in industrial processes, like a delayed response from a service

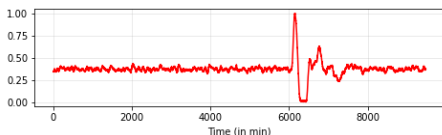
• Data stream

• Anomaly



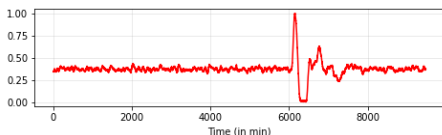
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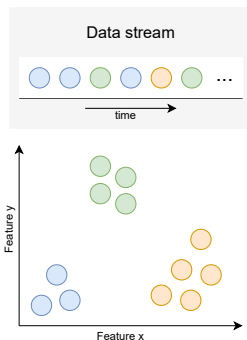
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Evolving Data Streams

- Unbounded sequence of data samples
- Concept drift
- Fast single pass data processing



EvolveNet

- Evolving embedding framework for novelty detection
- Goals of EvolveNet:
 - Learn and keep the data representations relevant even with data concept drift
 - Perform unsupervised learning
 - Novelty detection in an online way

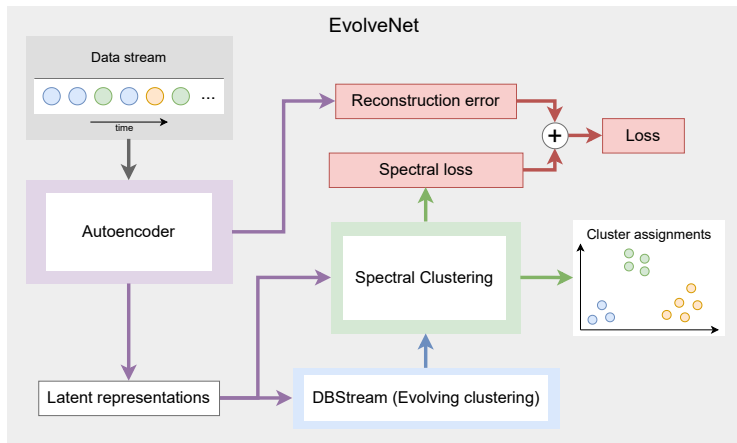


EvolveNet

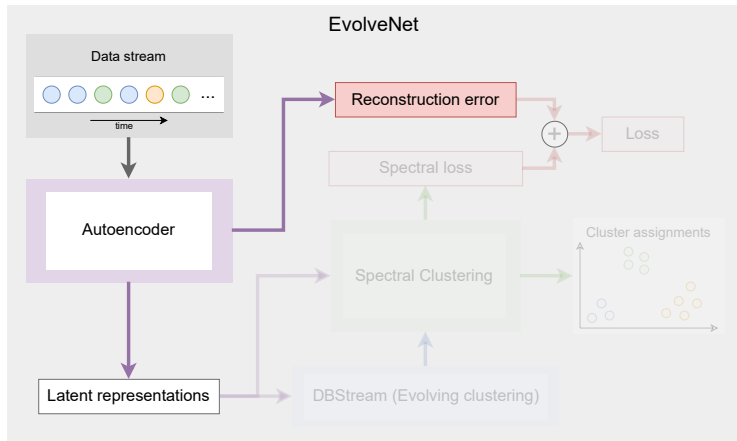
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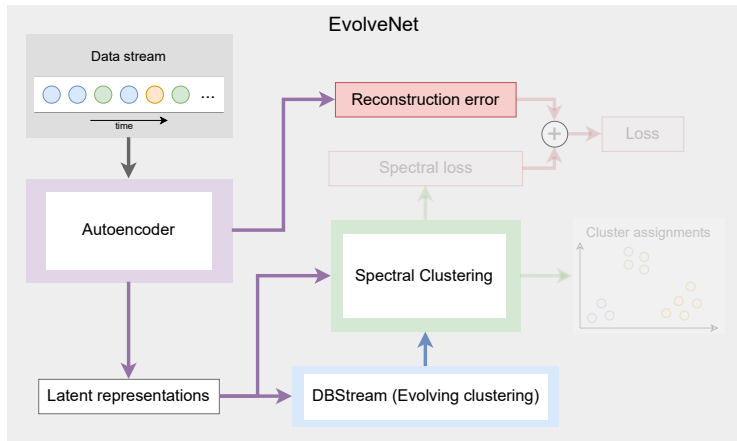
EvolveNet - Pipeline



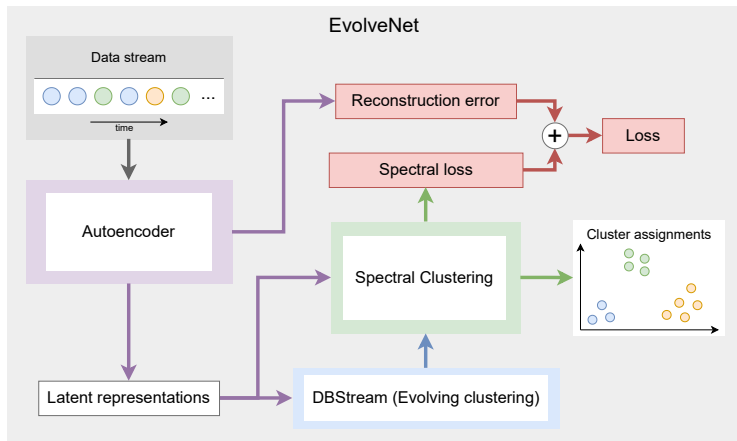
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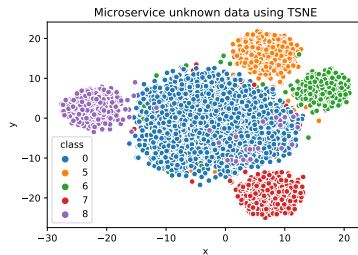
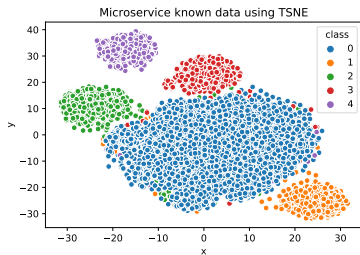


Preliminary Results

- Dataset:
 - Benchmark of microservices use cases
 - 15,000 samples
 - 19 features
 - 4 abnormal events

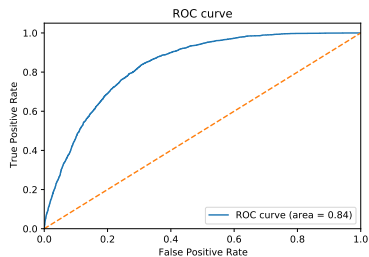


Preliminary Results



Preliminary Results

- Metrics:
 - Accuracy: 0.736
 - Precision: 0.592
 - F1 score: 0.700
 - Recall: 0.853



Current State

- Adjusting our framework to provide cluster assignments
 - Novelty detection
 - Updating the data representation
 - Data visualization
- Benchmark of microservices use cases
- We are looking for real-life data
 - Bugs, attacks, misconfigurations, software updates, etc.



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Thank You!

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