1. Overview

This package contains the source code, datasets, and configuration files used in the experimental evaluation presented in the accompanying paper. Five streaming outlier detection algorithms are included: KNODE, CPOD, MMCOD, NETS, and LEAP. The provided scripts and parameter files allow the experiments reported in the paper to be reproduced.

2. Package Contents

After downloading and decompressing the archive, the following files and directories are available:

2.1 Datasets

Five real-world datasets are provided as plain text files:

- SourceFile0.txt — TAO
- SourceFile1.txt — STOCK
- SourceFile2.txt — HPC
- SourceFile3.txt — GAS
- SourceFile4.txt — EM

Each file contains streaming data points used in the experimental study.

2.2 Algorithms Implemented

Five C++ projects are included, each corresponding to one algorithm evaluated in the paper: 1) KNODE, 2) CPOD, 3) MMCOD, 4) NETS, and 5) LEAP. Each project is provided as source code only (.cpp and .h files).

2.3 Configuration and Auxiliary Files

- Parameter files: `test0.txt` – `test4.txt`
- Stream speed files: `change_s.txt` and additional alternative speed files

Each parameter file corresponds to a specific dataset (e.g., `test0.txt` corresponds to `SourceFile0.txt`).

3. Build Instructions

All algorithms are implemented in standard C++ and provided as source code. They can be compiled using any standard-compliant C++ compiler (C++14).

After placing all .cpp and .h files for an experiment (taking KNODE for example) in the same folder, you can generate an executable file using the following command :

```
g++ -std=c++14 -O2 *.cpp -o KNODE.exe
```

4. Execution Instructions

To simplify execution, we provide Windows batch script files (`.bat`) that launch the experiments in a single step.

4.1 Required Files in the Working Directory

Before execution, ensure that the following files are placed in the same directory:

- Algorithm script file (e.g., `KNODEScript.bat`)
- Algorithm executable (e.g., `KNODE.exe`)
- Parameter files: `test0.txt` – `test4.txt`
- Dataset files: `SourceFile0.txt` – `SourceFile4.txt`
- Stream speed file: `change_s.txt`

Note: Each parameter file corresponds to a specific dataset (e.g., `test0.txt` is used with `SourceFile0.txt`). All files must be located in the same directory.

4.2 Running the Experiments

Run the algorithm by executing the corresponding script file:

```
KNODEScript.bat
```

After execution completes, a log file (e.g., `KNODELogFile.txt`) will be generated in the current directory.

5. Data Format

Each dataset consists of streaming data points, with one point per line. Values are space-delimited.

Example (3-dimensional data point): `0.04 84.87 23.436`

6. Parameter File Formats

6.1 KNODE/CPOD/MMCOD/NETS/LEAP

The test file for KNODE, CPOD, MMCOD, NETS, and LEAP contains 4 space-delimited parameters: `d r k n`.

Where: `d` – data dimensionality (e.g., `d = 3`)

`r` – query radius (e.g., `r = 1.9`)

`k` – neighbor count threshold (e.g., `k = 50`)

`n` – the number of slides in the current window (e.g., `n = 20`)

7. Stream Speed Configuration

To evaluate the impact of streaming speed on algorithm performance, different stream speed files are provided.

To use an alternative stream speed:

- Select the desired speed file.
- Rename it to change_s.txt.
- Replace the existing change_s.txt file in the working directory.