OutbreakPAD

OutbreakPAD (Outbreak Predictor And Detector) is a Python 3 library. This library functions to detect and predict hospital acquired infectious outbreak events.

Downloads and installations

```
$ git clone https://github.com/pandafengye/OutbreakPAD.git
$ cd OutbreakPAD
$ python setup.py install
```

Example

```
from OutbreakPAD import *
#   Forecasting with ARIMA-GRNN (recommended)
OutbreakPAD.PAD(example,p=2,d=0,q=1,a="ARIMA-GRNN",pvalue_cusum_k=1.5)
```

OutbreakPAD iutput file：

The input file is a time series (Column 1, date; Column 2, case number), as follows:

```
2014-01-01   3
2014-01-02   1
2014-01-03   3
2014-01-04   1
……
2014-08-15   30
2014-08-16   26
2014-08-17   30
2014-08-18   26
```

OutbreakPAD output file：

The output of OutbreakPAD is a folder labelled "Outbreak_result", which contains the subdirectories. The folder, "History_record", contains the detected outbreak events that had already taken place within the time series. The folder, "Prediction", contains the results predicting whether an outbreak would occur at the end of the time series.

```
.
├── History_records
│   └── Origin_Outbreaks_detected_by_seven_detection_methods.csv
└── Prediction
    ├── 225_Outbreaks_detected_by_seven_detection_methods.csv
    ├── 226_Outbreaks_detected_by_seven_detection_methods.csv
    ├── 227_Outbreaks_detected_by_seven_detection_methods.csv
    └── 228_Outbreaks_detected_by_seven_detection_methods.csv
```

In each folder, the resulting file,
"**Outbreaks_detected_by_seven_detection_methods.csv**" is displayed below:

Buishand_U_Test	['2014/08/05']
CUSUM	['2014/08/06-2014/08/17']
EWMA	['2014/08/06-2014/08/17']
Mann-Kendall	[]
P value-CUSUM	[]
Pettitt	['2014/03/01']
Standard Normal Homogeinity Test	['2014/08/05']

The first column is the detection method; the second is the outbreak date detected by the corresponding method.

Note:
It is strongly recommended that the folder, "Outbreak_result", be immediately renamed subsequent to running the program; if this is not done, the resulting folder produced following the program's last operation would be overwritten.