

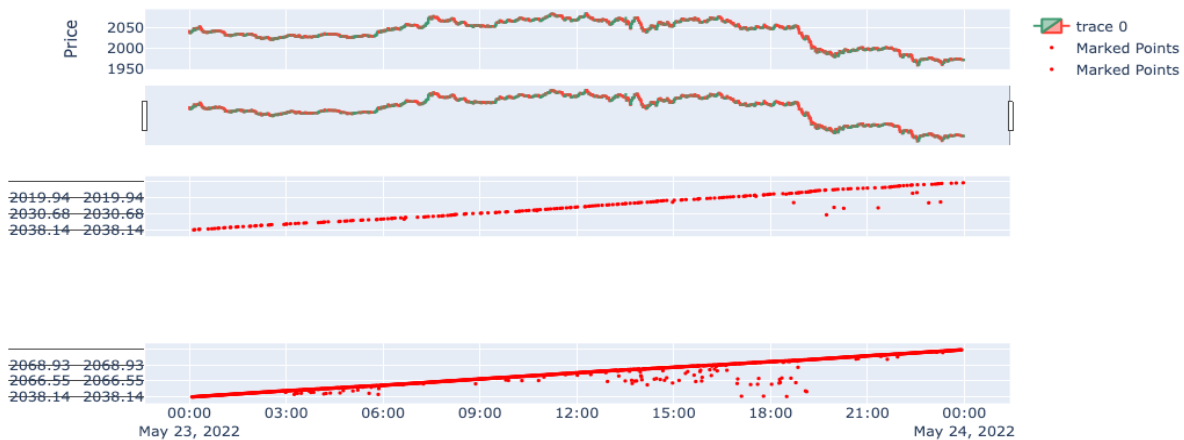
05/23/2022 ETH/USD Comparison Results

For all comparisons, the bottom chart represents DL-based anomaly detection, a potential benchmark for true positive (if given large dataset)

Smoothing Kernel with 1min frequency

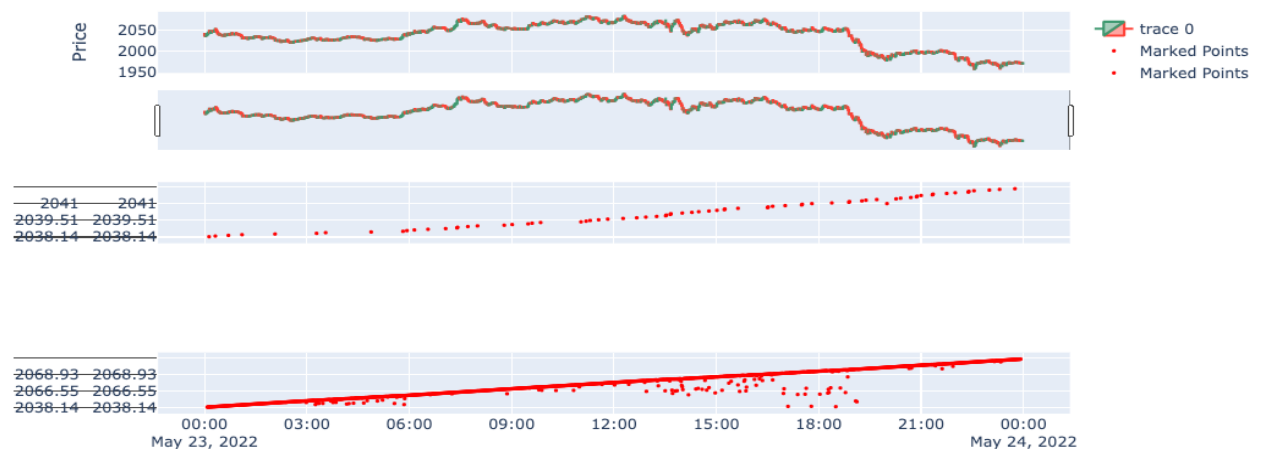
```
1 a = AnomalyDetector(df=df, freq = '1min')  
2 a.anomaly_dynamic_smoothing('smoothing')
```

Candlestick Chart



Vol Kernel with 1min frequency

Candlestick Chart



Under 1min frequency, “smoothing” kernel caught an excessive number of false positives. “vol” kernel is a better choice under this setting.

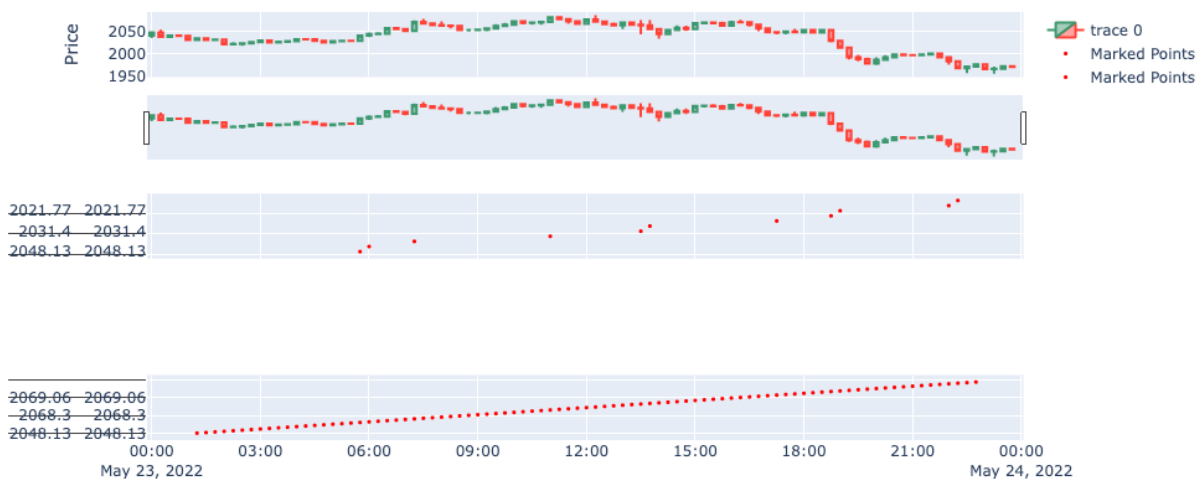
Smoothing Kernel with 15min frequency

Candlestick Chart



Vol Kernel with 15min frequency

Candlestick Chart

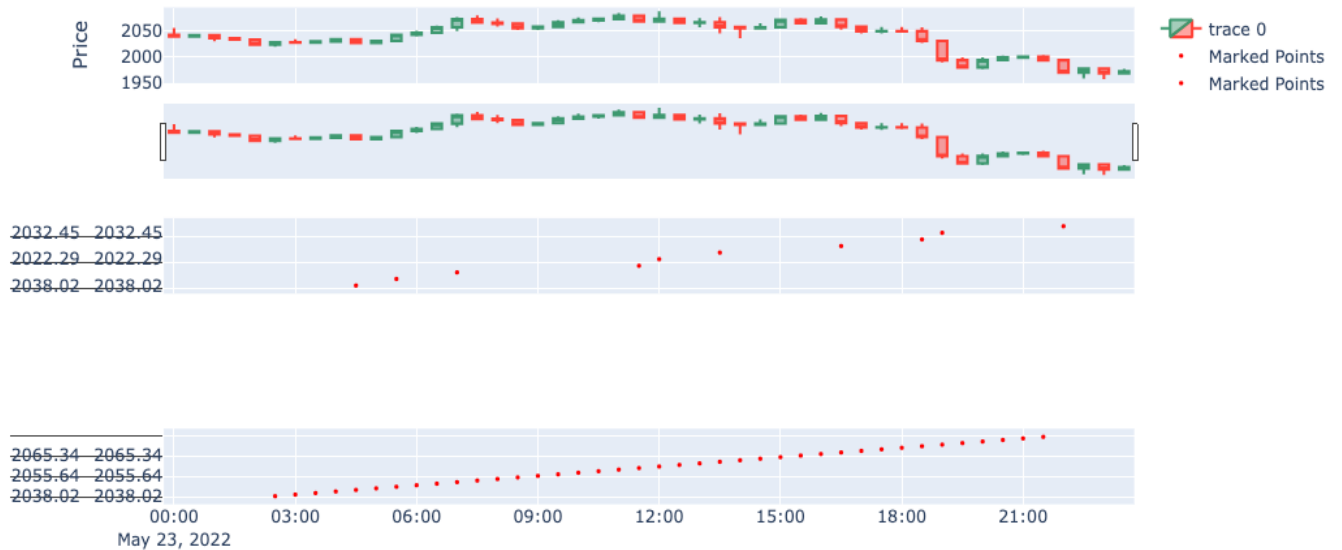


Under 15 min frequency, “smoothing” kernel is able to catch more anomaly signals than “vol” kernel.

Smoothing Kernel with 30min frequency

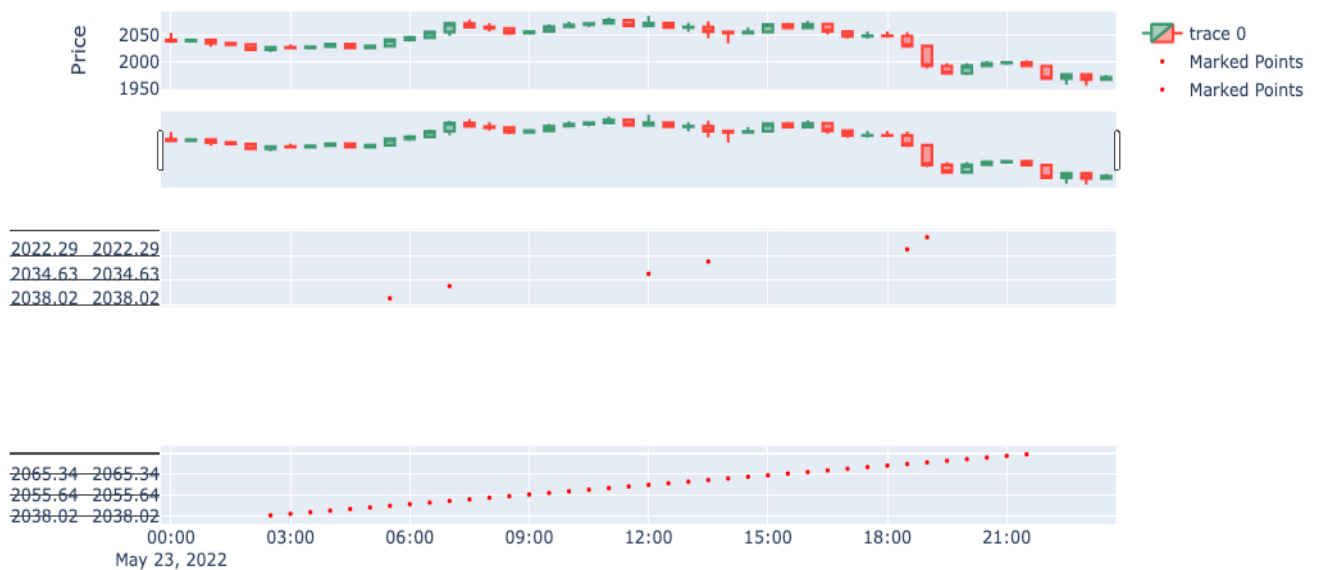
```
1 a = AnomalyDetector(df=df, freq = '30min')
2 a.anomaly_dynamic_smoothing('smoothing')
```

Candlestick Chart



Vol Kernel with 30min frequency

Candlestick Chart

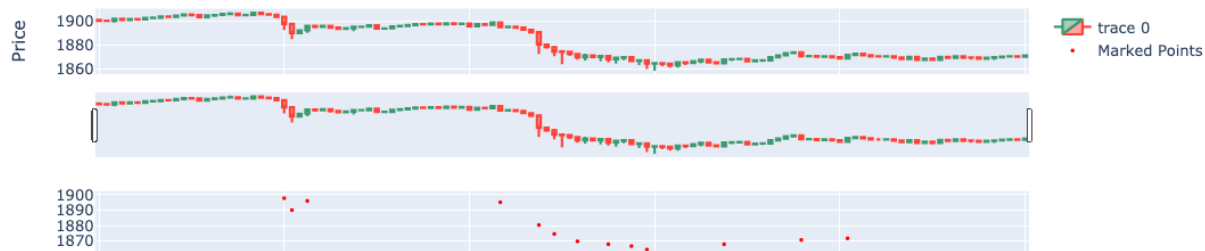


Under 30 min frequency, “smoothing” kernel is able to catch more true positive signals than “vol” kernel.

The below graphs compare the performances of the quantile of returns based off of various frequencies and quantiles. The data range is from 01/01/2023 to 06/25/2023. All the quantiles are two-sided. Users may specify the data date range and the date threshold that splits training and testing datasets.

0.9 Quantile with 5min frequency

Candlestick Chart



0.9 Quantile with 30min frequency

Candlestick Chart



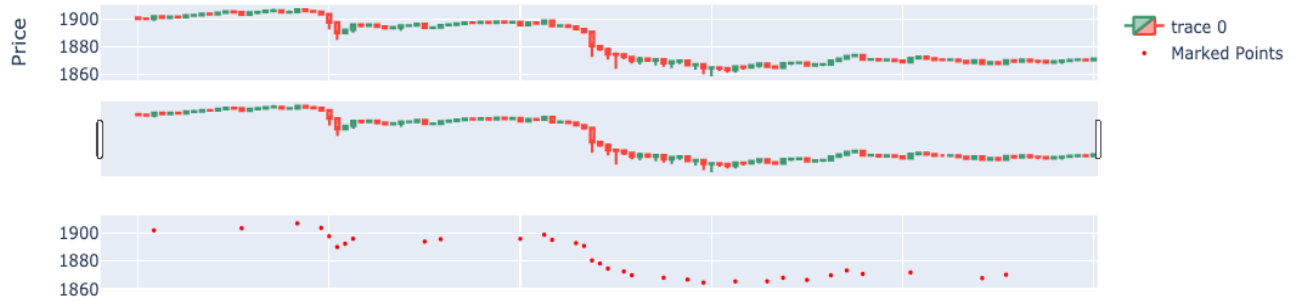
0.9 Quantile with 15min frequency

Candlestick Chart



0.8 Quantile with 5min frequency

Candlestick Chart



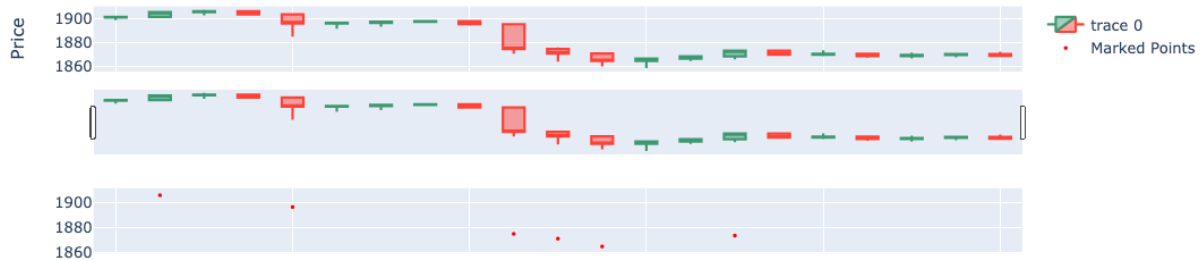
0.8 Quantile with 15min frequency

Candlestick Chart



0.8 Quantile with 30min frequency

Candlestick Chart



From my naked eyes, 0.8 quantile with 5 min frequency is the best performer, but the other trading frequencies also perform decently.