## 1. Differences of Hawkes process methods

There are 3 methods for Hawkes processing as follows;

M1 = SEISMIC(2015, Zhao, et. Al)

M2 = TiDeH [2016, Kobayashi and Lambiotte]

M3 = MaSEPTiDE [2017, Feng Chen and Wai Hong Tan]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | M1 | M2 | M3 | 1971 year |
| Memory kernel function | [3] Formula (1) | [1] Formula (2) | [3] Formula (2) | The Formula In [3] 7p 5-th line |
|  |  |  |  |  |
| Parameter estimates |  |  |  |  |
| performance index | APE(Absoluted percent error) |  |  |  |

## 2. Performance comparison

The performance indexes are APE (absolute percent error) and RMSE.

Simulations show that M3 is the best.

Table 3 in [3] shows APE mean and APE median.

“mean” means the average of values {a1, a2, … an} and “median” means the middle value of values {a1, a2, … an}.

For an example, if {a1, a2, … an} = {1, 2, 4, 5, 6}, mean = 3.6 and median = 4.

## References

[1] paper01.pdf

[2] paper02.pdf

[3] paper03.pdf

[4] python library of hawkes.pdf

[5] seismic.pdf