CMAF forecasting packages in practice

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Packages of CMAF

We currently support the following packages:

- greybox;
- smooth;
- MAPA;
- tsintermittent;
- nnfor;
- tsutils;
- diffusion.

greybox package

greybox package

v0.5.1 on CRAN.

Implements functions and instruments for regression model building and its application to forecasting.

- Focus on time series;
- Variables selection and models specification;
- Dynamic regressions;
- Measuring forecasting performance.

greybox package

Functions:

- Advanced Linear Model, `alm()`;
  - Different distributions for the response variable;
  - Mixed distributions;
  - ARI(p,d) in the residuals.
- Stepwise forward based on ICs, `stepwise()`;
- Combination of alm models, `lmCombine()`;
- Error measures: MAPE, MPE, RelMAE etc, `measures()`;
- Intervals measures: `MIS()`, `RelMIS()`, `pinball` etc;
- Rolling origin evaluation: `ro()`;
- and more...

greybox package

Demonstration

smooth package

smooth package

v2.5.0 on CRAN.

Implements Single Source of Error state space models for purposes of time series analysis and forecasting.

- Exponential smoothing in ETS framework, `es()`;
- Simple Moving Averages, `sma()`;
- Seasonal ARIMA, `ssarima()`, `auto.ssarima()`;
- Multiple seasonal ARIMA, `msarima()`, `auto.msarima()`;
- Vector Exponential Smoothing, `ves()`;
- Intermittent demand state space model, `es()`, `oes()`;
- etc.

smooth package

Advantages of `es()`:

- More flexibility (more models);
- Explanatory variables, with the automatic selection;
- Different cost functions (MSE, MAE, trace versions,...);
- Different types of prediction intervals;
- Combination of models based on ICs;
- Selection between pure additive / pure multiplicative models;
- Handling the intermittent data.

smooth package

Advantages of `ssarima()`, `msarima()`:

- Any orders, any lags you want;
- Order selection;
- Explanatory variables with the selection mechanism;
- Combination of models;
- Intermittent data.

smooth package

Demonstration

MAPA package

MAPA package

v2.0.4 on CRAN.

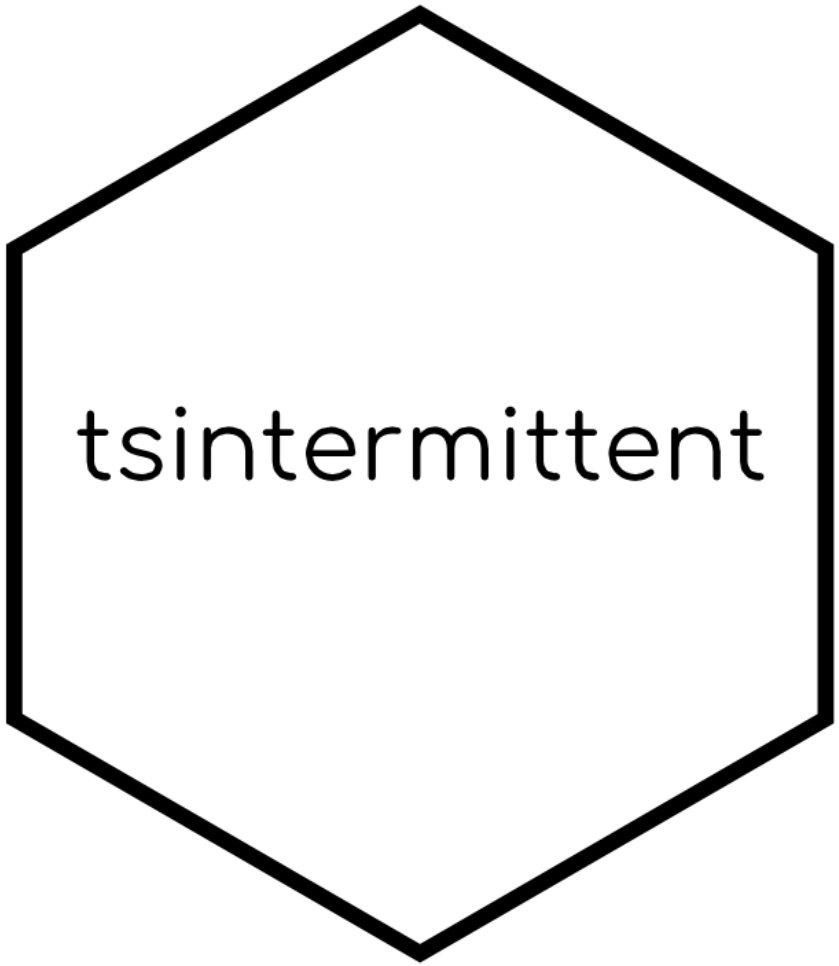
Functions and wrappers for using the Multiple Aggregation Prediction Algorithm (MAPA) for time series forecasting.

- MAPA based on `ets()` from `forecast` package;
- MAPA based on `es()` from `smooth` package;
- MAPAx;
- MAPAx with any features of either `ets()` or `es()`.

MAPA package

Demonstration

tsintermittent package



tsintermittent package

v1.9 on CRAN.

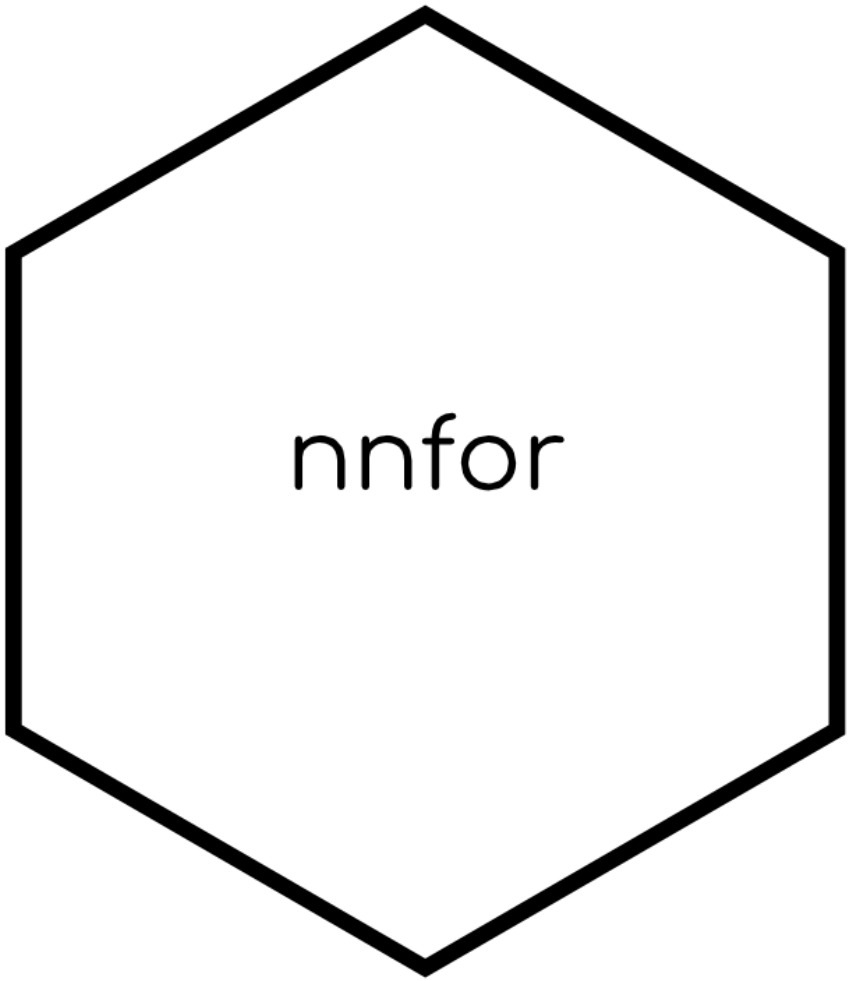
Functions for analysing and forecasting intermittent demand / slow moving items time series.

- Croston's method with different cost functions, `crost()`;
- TSB method with the same, `tsb()`;
- SBA method, `sba()`;
- Intermittent version of MAPA, `imapa()`;

tsintermittent package

Demonstration

nnfor package



nnfor package

v0.9.6 on CRAN.

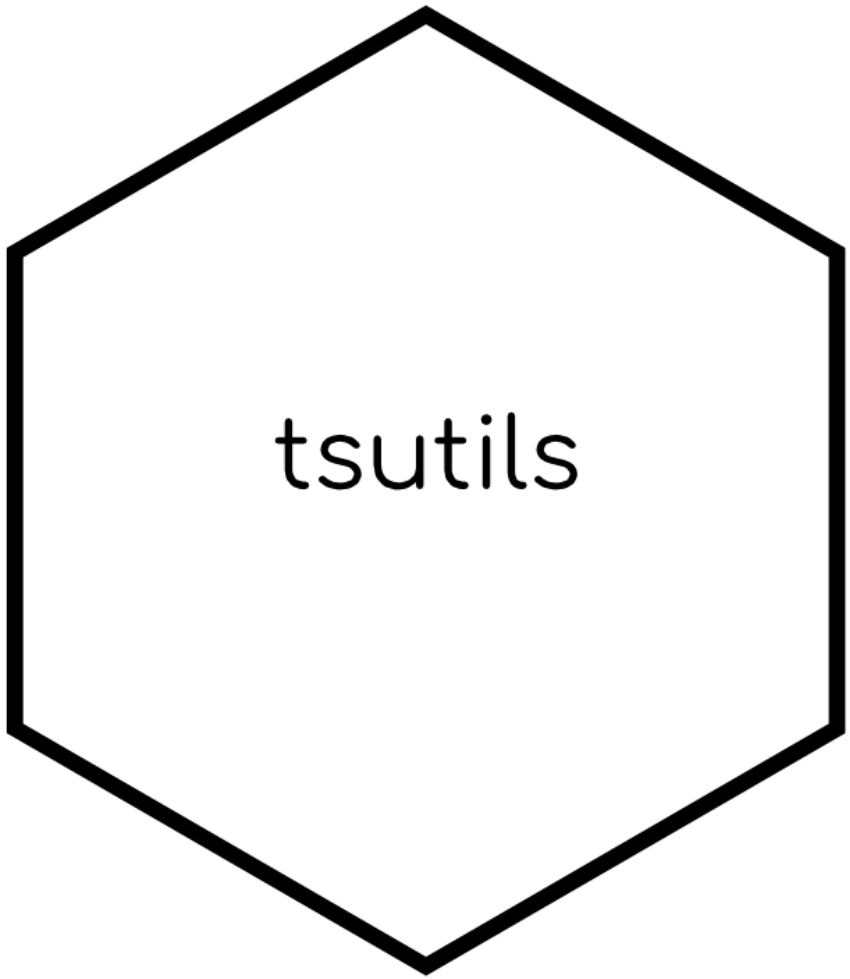
Automatic time series modelling with neural networks. Allows fully automatic, semi-manual or fully manual specification of networks.

- Multilayer Perceptron, `mlp()`;
- Extreme Learning Machine, `elm()`;
- Both are based on AR(p) and can use explanatory variables;

tsintermittent package

Demonstration

tsutils package



tsutils package

v0.9.0 on CRAN.

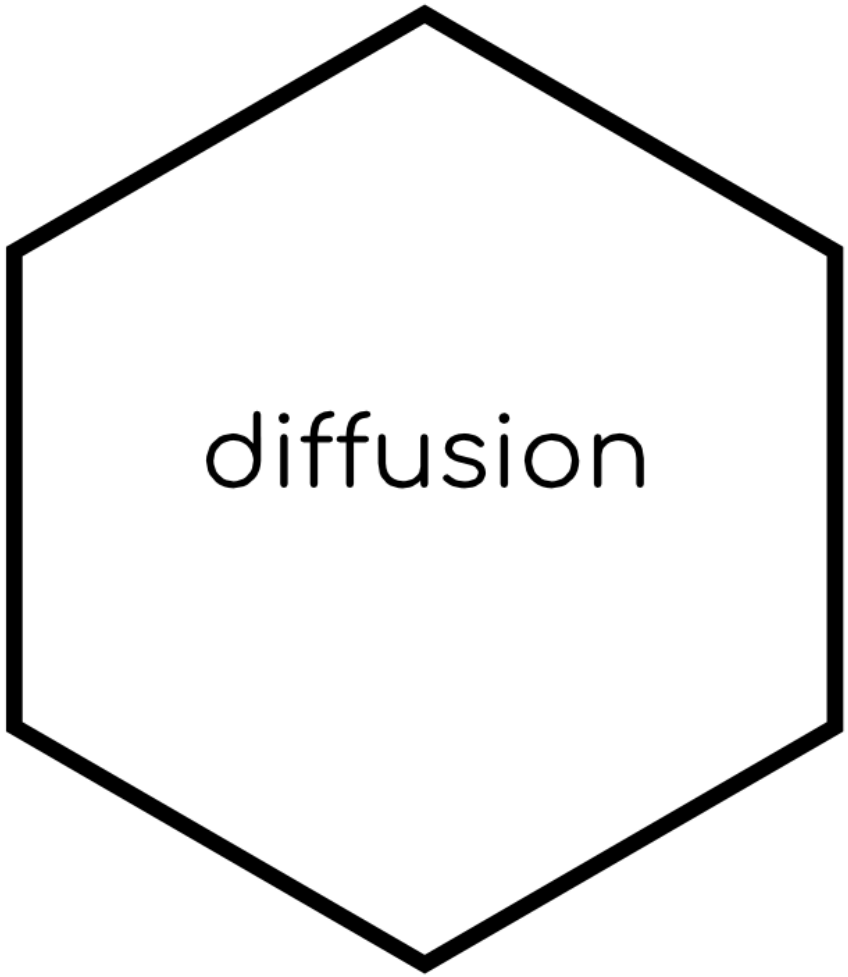
Time Series Exploration, Modelling and Forecasting.

- tools for time series exploration and decomposition;
- an implementation of the Theta method;
- tools to facilitate the design of the forecasting process, such as ABC-XYZ analyses;
- forecasts evaluation instruments.

tsintermittent package

Demonstration

diffusion package



diffusion package

v0.2.7 on CRAN.

Various diffusion models to forecast new product growth.

- Bass method;
- Gompertz method;
- Gamma/Shifted Gompertz curve.

tsintermittent package

Demonstration

Thank you for your attention!

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Marketing Analytics
and Forecasting

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