时序资料汇总：模型和常见库对比

kaggle竞赛宝典 2022-08-14 23:39 发表于上海

以下文章来源于Coggle数据科学 ，作者Coggle

Coggle数据科学
Coggle全称Communication For Kaggle，专注数据科学领域竞赛相关资讯分享。

↑↑↑关注后"星标"**kaggle竞赛宝典**

kaggle竞赛宝典技巧

Coggle

时序资料汇总：模型和常见库对比

简介

上百数据实战技巧，欢迎关注Kaggle竞赛宝典。

kaggle竞赛宝典
数据竞赛Top方案，竞赛黑科技，竞赛到入职的一些感想。
284篇原创内容

公众号

Part1 领域介绍

Time series is a series of data points indexed in time order.

时间序列分析具体包括的任务：

- 检索Indexing (query by content) : given a time series and some similarity measure, find the nearest matching time series.
- 聚类Clustering : find groups (clusters) of similar time series.
- 分类Classification : assign a time series to a predefined class.
- 分割Segmentation (Summarization) : create an accurate approximation of a time series by reducing its dimensionality while retaining its essential features.
- 预测Forecasting (Prediction) : given a time series dataset up to a given time tn, forecast the next values.
- 异常检测Anomaly Detection : find abnormal data points or subsequences.
- 因果分析Rules Discovery : find the rules that may govern associations between sets of time series or subsequences

推荐教材

- Forecasting: Principles and Practice，第三版（英文），第二版（中文）

推荐公开课

- Intel 时间序列分析：讲授时间序列分析，以及用于预测、处理和识别顺序数据的方法。
  - 时间序列和平稳数据简介
  - 数据平滑化、自相关性和自回归积分滑动平均 (ARIMA) 模型等应用

- 高级时间序列概念，如卡尔曼滤波器 (Kalman Filter) 和傅里叶变换 (Fourier Transformation)
- 用于时间序列分析的深度学习架构和方法

Part2 时序Python库

	Forecasting	Classsification	Anomaly Detection	Segmentation	TSFeature
Prophet	✅				
Kats	✅		✅		✅
GluonTS	✅		✅		✅
NeuralProphet	✅		✅		✅
arch	✅				
AtsPy	✅				
banpei			✅		
cesium					✅
darts	✅				
PaddleTS	✅				✅

- Kats，推荐指数：☆☆
  - 主页：https://facebookresearch.github.io/Kats/
  - Github：https://github.com/facebookresearch/Kats
- darts，推荐指数：☆☆
  - 介绍：a Python library for easy manipulation and forecasting of time series. It contains a variety of models, from classics such as ARIMA to deep neural networks.
  - 主页：https://unit8co.github.io/darts/
  - Github：https://github.com/unit8co/darts
- GluonTS，推荐指数：☆☆☆☆
  - 主页：https://ts.gluon.ai/index.html
  - Github：https://github.com/awslabs/gluon-ts/
- NeuralProphet，推荐指数：☆☆☆☆
  - 主页：https://neuralprophet.com/
  - Github：https://github.com/ourownstory/neural_prophet
- arch
  - 介绍：Autoregressive Conditional Heteroskedasticity (ARCH) and other tools for financial econometrics, written in Python.
  - 主页：https://arch.readthedocs.io/en/latest/
  - Github：https://github.com/bashtage/arch
- AtsPy
  - 介绍：Automated Time Series Models in Python
  - Github：https://github.com/firmai/atspy
- banpei
  - 介绍：Anomaly detection library based on singular spectrum transformation
  - Github：https://github.com/tsurubee/banpei

- cesium
  - 介绍：end-to-end machine learning platform for time-series, from calculation of features to model-building to predictions.
  - 主页：https://cesium-ml.org/
  - Github：https://github.com/cesium-ml/cesium
- pyfbad
  - Github：https://github.com/Teknasyon-Teknoloji/pyfbad

更多的模型介绍可以查阅论文[arxiv 2021]A systematic review of Python packages for time series analysis.

Part3 相关模型

Time Series Forecasting

Model	Univariate	Multivariate	Probabilistic	Multiple-series training
ARIMA	✅		✅	
VARIMA	✅	✅		
AutoARIMA	✅			
ExponentialSmoothing	✅		✅	
Theta and FourTheta	✅			
Prophet	✅		✅	
FFT (Fast Fourier Transform)	✅			
RegressionModel (incl RandomForest, LinearRegressionModel and LightGBMModel)	✅	✅		✅
RNNModel (incl. LSTM and GRU); equivalent to DeepAR in its probabilistic version	✅	✅	✅	✅
BlockRNNModel (incl. LSTM and GRU)	✅	✅	✅	✅
NBEATSModel	✅	✅	✅	✅
TCNModel	✅	✅	✅	✅
TransformerModel	✅	✅	✅	✅
TFTModel (Temporal Fusion Transformer)	✅	✅	✅	✅
Naive Baselines	✅			

Time Series Classification

- LSTM FCN，LSTM Fully Convolutional Networks for Time Series Classification

Anomaly Detection

- [AAAI 2022] Towards a Rigorous Evaluation of Time-series Anomaly Detection

Time Series Representation

- [AAAI 2022] TS2Vec: Towards Universal Representation of Time Series

Data Augmentation

- [IJCAI 2021] Time Series Data Augmentation for Deep Learning: A Survey

- [arxiv 2020] An empirical survey of data augmentation for time series classification with neural networks

Part4 时序数据集

- UCR Time Series Classification Archive
- UEA & UCR Time Series Classification Repository

kaggle竞赛宝典
数据竞赛Top方案，竞赛黑科技，竞赛到入职的一些感想。
284篇原创内容

公众号

喜欢此内容的人还喜欢

NAACL'22 让Transformer提速80%的神操作
圆圆的算法笔记

位置编码综述（二）：部分模型介绍
时空数据智能实验室

R语言入门，最好的资源都在这里！
气候变化与亲环境行为