

Análise de Séries Temporais e Predição

Project

Time Series Characterization, Modeling and Forecasting

MECD – 2021/22

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FACULDADE DE
CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE DE
COIMBRA

Duration:

10 weeks

Workload:

30h/student

Project description

The Project consists of the characterization, modeling and forecasting of a time series (TS) from a topic of interest to the group. Each group is composed by two or, exceptionally, three students. The composition of the groups and their assigned time series are depicted in ***Groups and Datasets*** section.

You should apply the methods thought during the course to your time series (only the ones that are suited to it) and provide a critical analysis on time series description, modeling and forecasting.

Split your TS into two: the first part of the TS should be used for characterization, modeling and training, whilst some of the last part of the TS should be used to assess the forecasting performance of your methods. The amount of data left for testing is something you should also define in function of your TS.

In the end, write a report in a IEEE paper format describing your work, and prepare a presentation to the class.

Report Format:

You are requested to submit your report in a IEEE paper format (you can find Word and Latex templates here: <https://www.ieee.org/conferences/publishing/templates.html>).

The suggested number of pages is 4. You can exceed this limit by one or two pages if you really need to (6 pages max).

Write your article in a **IMRaD** format (Introduction, Methods, Results and Discussion):

Introduction:

- Describe the “problem” you are addressing, why it is important and the challenges facing.
- Describe the dataset you worked with.
- Give a small overview of the state of the art in this topic.

Methods:

- Describe the methods you used to characterize, model and forecast the TS, and how you analyze and validate your result.

Results:

- Show the results you obtained. Represent them in plots and/or tables.

Discussion:

- Discuss your results, in scope with the state of the art.
- Derive some conclusions
- Identify future steps to develop the work, so other can build upon your research

Besides those sections, you must provide an abstract, title and authors identification on the first page.

Important dates:

- **Evaluation checkpoint: 2021/11/06 – on class**

For this evaluation checkpoint students are expected to have a initial description of the problem and time series characterization. This does not constitute a formal submission, but students will have

to show their progress to the professor, in class, and will be graded on a binary scale:

0 – Behind schedule

1 – On schedule/ahead of schedule

This corresponds to 10% of the final grade. Note this serves mainly for students to get feedback from the professor. Quality of the work is not evaluated at this phase, only progress.

▪ **Final Submission: 2021/12/10 23h59**

Students must submit their report, on IEEE paper format, by this date in *infoforestudante* platform.

▪ **Class Presentation: 2021/12/14 – on class**

Students must present their paper to the class in a 10 min presentation + 5 min discussion. All members of the group must talk during the presentation. Presentation quality and discussion will constitute 20% of the grade.

Grading:

$Grade(\%) = checkpoint * 10\% + paper * 70\% + presentation * 20\%$

$Grade[0-8] = Grade(\%) * 8$

Groups and Datasets

Student Number	Student Name	Project Topic(s)	Link to dataset(s) file(s)
2017247458	João Cardoso	Energy Consumption in the USA (2004-2018 / Hourly)	https://www.kaggle.com/robikscube/hourly-energy-consumption
2017266263	Miguel Marques		
2020185594	Beatriz Patrício	Novos casos de COVID-19 em Portugal	https://github.com/dssg-pt/covid19pt-data/blob/master/data.csv
2017268942	Beatriz Silva		
2016223968	Guilherme Cruz		
2017252749	Nuno Mendes	DEEC energy demand: analysis and forecasting, [2009 - 2020]	https://drive.google.com/drive/folders/1nMaAGnMjEgzoXt4SVNKYKds5OCy05r8o?usp=sharing
2017248835	Rafael Matos		
2016228030	José Pereira	Residential Power Usage [2016 - 2020]	https://www.kaggle.com/srinuti/residential-power-usage-3years-data-timeseries?select=power_usage_2016_to_2020.csv
2016244072	Gonçalo Sousa		
2017254561	Leonor Coelho	Netflix Stock data from 2002 to 2021	https://www.kaggle.com/pritsheta/netflix-stock-data-from-2002-to-2021
2017242428	Tiago Fernandes		
2020207009	Mariana Coelho	Daily temperature analysis	https://www.kaggle.com/sudalairajkumar/daily-temperature-of-major-cities/code
2016220812	Georgiana Corduneanu		
2016231080	Eduardo Guerra		
2021191999	Nicolai Lawrenz	Google search for 'Home alone'	https://trends.google.com/trends/explore?date=all&q=home%20alone
2021193054	Lisa Drescher		
2021169753	Juř Hladnik		