

An Explainable Machine Learning Approach of PET Imaging for Individualized Predictions of Seizure Outcomes after Temporal Lobe Epilepsy Surgery

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Introduction

The Data

The Model

The Explanation

Conclusion

Introduction
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The Data
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The Model
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The Explanation
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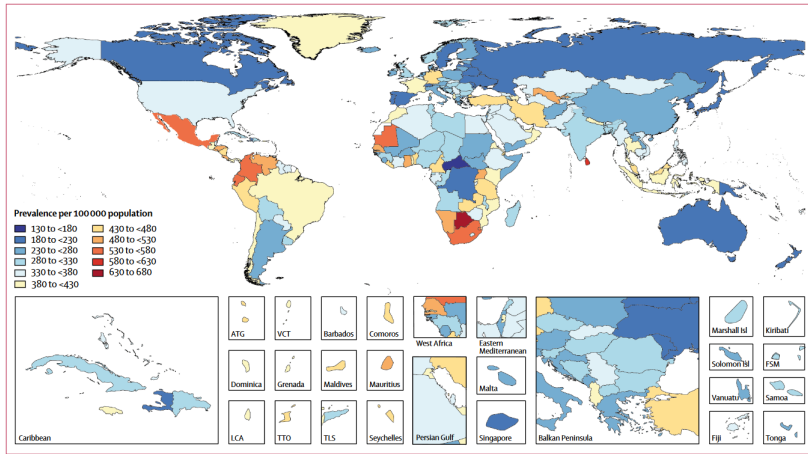
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References

Introduction

Background

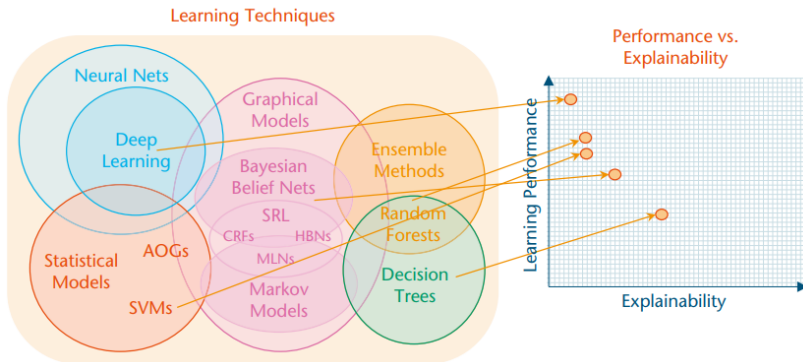
Epilepsy epidemiology



Prevalence per 100000 of idiopathic epilepsy, 2016(Beghi et al., 2019)

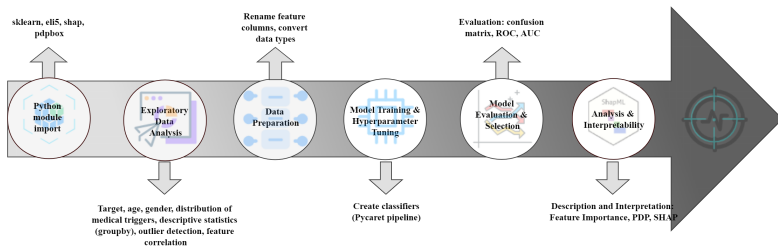
Aims

- Focuses on examining the interpretability of machine learning models rather than just building a short-term recurrence prediction model (aka XAI).



Learning Performance Versus Explainability Trade-Off (Gunning and Aha, 2019)

Scheme



The Data

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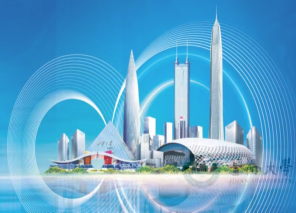
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References

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SHAP

- Shapley

The Model

Benchmark

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benchmark

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-
- KNN
- “ ” 5
- AUC
- AUC

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References

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PipeOp

PipeOps

%>>%

Graph

- PipeOp, %>>% gunion() ppl()
- Graph\$plot()
- as_learner(Graph)

•

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1.

- PipeOp
- %>>%
- PipeOp affect_columns Selector

The Explanation

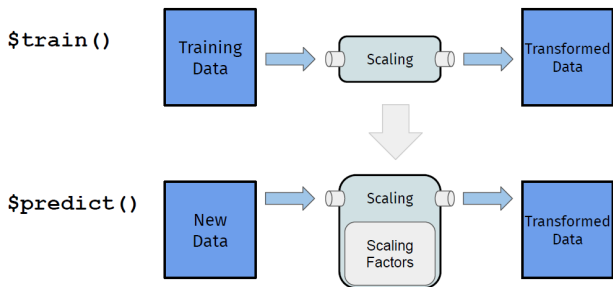


Figure 1:

- 3 KNN SVM Ranger

- method:

"grid_search"

"random_search"

gensa

"nloptr"

■

1.

(1)

`mlr3filters`

Conclusion

con

(2)

” ”

ranger

”impurity”

```
task$select()
```

2.

`mlr3fselect`

- `fselect()`
- `auto_fselector()`,
- `fselect_nested()`

■

R mlr3verse (?)

For more theoretical approaches to machine learning model explanation, see [Interpretable Machine Learning: A Guide for Making Black Box Models Explainable](#), [What Causes Heart Disease? Explaining the Model](#), refer to [\(Rajpurkar, 2021\)](#), [\(Marc Becker, 2022\)](#), [\(Molnar, 2022\)](#)

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THANKS !



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