Project Planning Document

Dated: 22 Nov, 2024

**Note**: *This is a preliminary document outlining the project scope, requirements, and proposed solutions. It is subject to review and approval by both parties before proceeding with development.*

# Project Overview:

This project requires insertion of xcm algorithm into Early time Series classification. The project is already built upon several algorithms like used for early time series classification as mentioned in <https://github.com/xarakas/ETSC>.

* The project requires integration of xcm time series neural network model using strut algorithm.
* Project also needs integration of strut and xcm in the cli.
* Additionally, the project requires stacking of algorithms.

# Project Scope

*The scope of this project includes:*

1. **Integration of XCM Model**:
   * Combine the XCM time series neural network model with the Strut algorithm.
   * Enable its usage through the existing ETSC CLI.
2. **Development of Stacking Technique**:
   * Implement a stacking framework for early time series classification algorithms.
   * Provide CLI options to configure stacking parameters.

**Out of Scope**:

* Development of entirely new CLI unless explicitly approved.
* Support for multiple stacking layers or advanced model configurations outside of the defined CLI functionality.

# Proposed Solution:

We are proposing that you don’t build an entirely new cli and instead rely on existing cli. This saves development time for you.

If you think otherwise, we may provide a brand new cli for strut only that uses xcm model.

## *Phase 1: Insertion of xcm model into existing ets cli*

### Do’s: This proposes that you’d be able to use strut with xcm model like this in the existing ets cli. To achieve this, we need to combine strut with xcm model first. Just like strut is combined with minirocket\_fav. Following is the syntax of cli,you ‘ll be able to use.

ets -i "file location"" -v (3 for Biological or 7 Maritime) -d 0 -c -1 --trunc strut -m minirocket\_fav -p 0 -s 2

ets -i "file location"" -v (3 for Biological or 7 Maritime) -d 0 -c -1 --trunc strut -m xcm -p 0 -s 2

### Don’ts:

strut-xcm -t "training file name" -e "testing file name" --make-cv -h Class -c -1 --trunc -p 0 -s 2

strut-xcm -t "training file name" -e "testing file name" --make-cv -h Class -c -1 xcm --trunc -p 0 -s 2

Timeline: **15 Days**

## *Phase 2: Development of Stacking technique (Not finalized)*

Stacking requires assigning base learner models and meta learning models. It also requires that your data must be stationary.

**Questions for the client:**

We need to know what type of training data you want to use. Stationary or moving data?

Insert your answer here

Do you need to stack more than two algorithms?

Insert your answer here

### Do’s: Early time series algorithms shall be stacked. Cli will look something like this.

ets -i "file location" -v 3 -d 0 -c -1 --trunc strut -m minirocket\_fav,xcm --stack meta\_linear -p 0 -s 2

### Don’ts: multiple stacking

ets -i "file location" -v 3 -d 0 -c -1 --trunc strut -m minirocket\_fav,xcm,--stack meta\_linear -p 0 -s 2

Timeline: 10 days