

APPENDIX

A. User interactive menu

On the top left panel in the overall figure, Fig. 2, and in the detail figure, Fig. 4, the MTSC tool has seven options that allow users to adjust parameter values:

- Choose a file to upload: the dataset
- Frequency: the time series frequency
- MOB depth: the number of splits + 1
- Prune options: the criterion for pruning the MOB tree
- Split variables: domain-relevant attributes to be included as splitting variables
- Heatmaps color pallet - high values: color for high values
- Heatmaps color pallet - low values: color for low values
- Screenshot: creates a screenshot of all the results in a tab

This panel appears twice, juxtaposing two sets of settings in different tabs. Compared to having one long tab, using separate tabs to scroll down allows for a more convenient comparison of results.

Users can upload their own dataset to explore using the ‘Browse’ button. This dataset should include the specific columns ‘Series’ (all the time series), ‘Date’, ‘cat.co” (column that categorizes the series) names, and location-related information ‘latitude’, and ‘longitude’. It also needs to include other columns as splitting variables (domain-relevant attributes) with desired names. The frequency option helps the user to choose the time series frequency, which is currently ‘Weekly’ (for daily time series) or ‘Monthly’ (for monthly time series) for our MTSC tool.

By changing the MOB depth, users can change the number of clusters and thereby control the tree simplicity. A simpler tree usually corresponds to fewer domain-based attributes or at least fewer levels/categories of attributes.

Two other options in Fig. 2, the prune option and splitting variables, can also affect the number of clusters. Pruning MOB criteria allows for switching between BIC or AIC while splitting variables are domain-relevant attributes that can be selected or unselected by users based on their domain knowledge, as well as the depth to which they wish to explore. Note that the list of domain-relevant attributes is updated when changing the dataset. The heatmap color pallet (low and high values) can be modified based on user preferences. Finally, the ‘screenshot’ button allows the

results to be saved in each tab as a single image. Screenshots need to be taken separately for each tab.

To implement the selected MOB depth value, we need to run the full tree with all possible terminal nodes. We compute MSE for all possible splits or depths using the linear model inside each cluster. The biggest jump in MSE leads to pruning the MOB tree.