Methodology

Independently model time-series data related to displacement and predictors of displacement

Libraries, parameters, settings

1.1 Import necessary libraries
1.2 Define all parameters and choose various settings

Load data

Generate labels and features

Process labels and features

2.1 Read all datasets
2.2 Select countries to model, either manually or based on clustering INFORM risk index
2.3 Loop over selected countries. Learn a multi-output GP model per country.
- 2.4 Prepare individual time-series datasets before merging
- 2.5 (Different compared to multi-output model) ~~Merge multiple time-series~~
- 2.6 Replace zero values with NaNs
- 2.7 Divide dataset into training and testing set (currently, no validation set, but include if optimizing)
- 2.8 Standardize data based on training set
- 2.9 Convert labels/features into expected format for GP tool
- 2.10 Define training/testing sets in multi-output GP format

Train/test

- 3.1 Define any remaining model parameters
- 3.2 (Different compared to multi-output model) Define kernels - Add base, bias, white noise
- 3.3 Train model
- 3.4 Generate test data in GP format
- 3.5 Predict for test data

Save/plot outputs

- 4.1 Save data and forecasts
- 4.2 Plot outputs

Methodology

Simultaneously model multiple time-series data related to displacement and predictors of displacement (multiple-output GP)

Libraries, parameters, settings

1.1 Import necessary libraries
1.2 Define all parameters and choose various settings

Load data

Generate labels and features

Process labels and features

2.1 Read all datasets
2.2 Select countries to model, either manually or based on clustering INFORM risk index
2.3 Loop over selected countries. Learn a multi-output GP model per country.
- 2.4 Prepare individual time-series datasets before merging
- 2.5 (Key multi-output model step) Merge multiple time-series
- 2.6 Replace zero values with NaNs
- 2.7 Divide dataset into training and testing set (currently, no validation set, but include if optimizing)
- 2.8 Standardize data based on training set
- 2.9 Convert labels/features into expected format for multi-output GP tool
- 2.10 Define training/testing sets in multi-output GP format

Train/test

- 3.1 Define any remaining model parameters
- 3.2 (Key multi-output model step) Define kernels - Add base, bias, white noise, define appropriate coregionalization matrix
- 3.3 Train model
- 3.4 Generate test data in multi-output GP format
- 3.5 Predict for test data

Save/plot outputs

- 4.1 Save data and forecasts
- 4.2 Plot outputs