twinlab.EstimatorParams

class **twinlab.EstimatorParams**(*detrend=False*, *covar_module=None*, *estimator_type='single_task_gp'*)

Parameter configuration for the Gaussian Process emulator (estimator).

Variables:

- **detrend** (*bool, optional*) – Should the linear trend in the data be removed (detrended) before training the emulator? The defaults is `False`.

- **covar_module** (*Union[str, None], optional*) –

  Specifies the functions that build up the kernel (covariance matrix) of the Gaussian Process. The default is `None`, which means the library will use a default kernel, which is a scaled Matern 5/2. This can be chosen from a list of possible kernels:

  - `"LIN"`: Linear.
  - `"M12"`: Matern 1/2. A standard kernel for modelling data with a smooth trend
  - `"M32"`: Matern 3/2. A standard kernel for modelling data with a smooth trend.
  - `"M52"`: Matern 5/2. A standard kernel for modelling data with a smooth trend.
  - `"PER"`: Periodic. Good for modelling data that has a periodic structure.
  - `"RBF"`: Radial Basis Function. A standard kernel for modelling data with a smooth trend. A good default choice that can model smooth functions.
  - `"RQF"`: Rational Quadratic Function.

  Kernels can also be composed by using combinations of the `"+"` (addative) and `"*"` (multiplicative) operators. For example, `covar_module = "(M52*PER)+RQF"` is valid.

- **estimator_type** (*str, optional*) –

  Specifies the type of Gaussian process to use for the emulator. The default is `"single_task_gp"`, but the value can be chosen from the following list:

  - `"single_task_gp"`: The standard Gaussian Process, which learns a mean, covariance, and noise level.
  - `"fixed_noise_gp"`: A Gaussian Process with fixed noise, which is specified by the user. Particularly useful for modelling noise-free simulated data where the noise can be set to zero manually.

- `"heteroskedastic_gp"`: A Gaussian Process with fixed noise that is allowed to vary with the input. The noise is specified by the user, and is also learned by the Process.
- `"variational_gp"`: An approximate Gaussian Process that is more efficient to train with large datasets.
- `"mixed_single_task_gp"`: A Gaussian Process that works with a mix of continuous and categorical or discrete input data.
- `"multi_fidelity_gp"`: A Gaussian Process that works with input data that has multiple levels of fidelity. For example, combined data from both a high- and low-resolution simulation.
- `"fixed_noise_multi_fidelity_gp"`: A Gaussian Process that works with input data that has multiple levels of fidelity and fixed noise.

__init__(*detrend=False*, *covar_module=None*, *estimator_type='single_task_gp'*)

Methods

__init__([detrend, covar_module, estimator_type])	
`unpack_parameters`()	