The git repository provides all the codes and data to reproduce all the experiments related to the Campbell2D function that are described in the paper.

More precisely :

* **GpOutput2D-main contains the code from Elodie Perrin to perform FPCA combined with Gaussian Processes.**
* **Campbell2D.R is the Campbell2D function generating the Campbell maps.**
* [NewFitting\_Charlie\_v090821.RData](https://github.com/charliesire/quantization_Campbell2D/blob/main/NewFitting_Charlie_v090821.RData) are historical data related to the offshore conditions, providing the probabilistic distributions.
* Campbell\_utils.R contains different functions useful for all the notebooks.
* lloyd\_true.Rmd performs the lloyd algorithm with the true campbell maps.
* perf\_probas.Rmd tunes the hyperparameters of the metamodel and evaluates the precision of the metamodel on the evaluation of the probabilities.
* lloyd\_predict.Rmd performs the lloyd algorithm with the predicted campbell maps.
* [compute\_probas.Rmd](https://github.com/charliesire/quantization_Campbell2D/blob/main/compute_probas.Rmd) computes the probabilities associated to the Voronoi cells with a higher number of maps that the one used in the lloyd algorithm to increase precision.
* importance\_sampling\_error.Rmd compute the error from the Importance Sampling.
* [error\_quanti.Rmd](https://github.com/charliesire/quantization_Campbell2D/blob/main/error_quanti.Rmd) computes the relative difference between two quantization errors :
  + The reference one related to the prototype maps obtained with the true maps
  + The predicted one related to the prototype maps obtained ones obtained with the predicted