

notebook (/github/SheffieldML/notebook/tree/master)  
/ GPy (/github/SheffieldML/notebook/tree/master/GPy)

## Introduction

Here are a few notebooks outlining basic functionality of GPy

- [Handling models \(./models\\_basic.ipynb\)](#)
- [Basic GP regression \(./basic\\_gp.ipynb\)](#)
- [Working with kernels \(./basic\\_kernels.ipynb\)](#)

## Example GPy use

This set of examples shows some of the functionality of the GPy Gaussian process framework in python. The framework is BSD licensed and we welcome collaborators to develop new functionality.

### Multiple Output Gaussian Processes

- [Coregionalization with Gaussian Processes \(./coregionalized\\_regression\\_tutorial.ipynb\)](#) This tutorial shows the use of a coregionalized model within GPy. In particular such models can be used for multi-task or multi-output learning.
- [Coregionalization on Marathon Data \(./multiple\\_outputs.ipynb\)](#) This tutorial runs the multioutput regression on a higher level, introducing stacked hierarchical multitask regression.

### Different Noise Models

- [GP classification \(./basic\\_classification.ipynb\)](#) A very simple tutorial on GP classification.
- [Count Data with GPy \(./Poisson\\_regression\\_tutorial.ipynb\)](#) This tutorial gives an example of Poisson regression using GPy.
- [Heteroscedastic Gaussian Processes \(./heteroscedastic\\_regression.ipynb\)](#) This tutorial shows how heteroscedastic Gaussian processes can be fit using GPy (with an interactive widget!).

### Approximations

- [Sparse Gaussian Processes \(./sparse\\_gp\\_regression.ipynb\)](#) This tutorial gives a quick overview of the variational approximation used to fit sparse Gaussian processes.

### SVI

- [Stochastic Variational Inference for GP Regression \(./SVI.ipynb\)](#) A simple demonstration of using SVI to fit a regression model (requires the climin library)

### Partially parametric models

- [Parametric non-parametric Gaussian Process Regression](#) ([./ParametricNonParametricInference.ipynb](#)) The steps from Linear regression to non-linear regression and finally non-parametric (better: infinite parametric) regression.

## MCMC

- [Using Hybrid Monte Carlo to infer posterior distributions on kernel parameters](#) ([./sampling\\_hmc.ipynb](#))

## Other applications

- [Probabilistic metrics for GP-LVM and Bayesian GP-LVMs](#) ([./MagnificationFactor.ipynb](#)) Introduction to the probabilistic geometries approach for latent variable models, with a demonstration of the plotting tool for the visualization of magnification factors with different data sets.

## Developer and Own modules

- [Implementing Optimizers](#) ([./optimizer-implementation.ipynb](#))
- [Integral Kernels](#) ([./Integral\\_kernel.ipynb](#))

## GPy Configuration Files

- [Configuration Files](#) ([./config.ipynb](#)) Setting up your local GPy configuration.

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