

---

# MCUP

Aug 20, 2021



---

## Contents:

---

<b>1</b>	<b>mcup package</b>	<b>1</b>
1.1	Submodules . . . . .	1
1.2	mcup.config module . . . . .	1
1.3	mcup.data_generator module . . . . .	1
1.4	mcup.mcup module . . . . .	2
1.5	mcup.pee module . . . . .	2
1.6	mcup.utils module . . . . .	3
1.7	Module contents . . . . .	3
<b>2</b>	<b>Indices and tables</b>	<b>5</b>
	<b>Python Module Index</b>	<b>7</b>
	<b>Index</b>	<b>9</b>



## 1.1 Submodules

## 1.2 mcup.config module

### 1.2.1 config.py

Setting for the package and pregenerated data.

```
mcup.config.linear_fun(x, c)
```

## 1.3 mcup.data\_generator module

### 1.3.1 data\_generator.py

Data generation for testing.

```
class mcup.data_generator.DataGenerator(fun, data_len, boundaries, seed=None,  
                                         dtype=<class 'numpy.float64'>, params=None)
```

Bases: object

```
add_noise_x(const_err=None, stat_error=None)  
[summary]
```

#### Parameters

- **const\_err** (*[type]*, *optional*) – [description]. Defaults to None.
- **stat\_error** (*[type]*, *optional*) – [description]. Defaults to None.

**Returns** [description]

**Return type** [type]

```
add_noise_y (const_err=None, stat_error=None)  
[summary]
```

**Parameters**

- **const\_err** (*[type], optional*) – [description]. Defaults to None.
- **stat\_error** (*[type], optional*) – [description]. Defaults to None.

**Returns** [description]

**Return type** [type]

## 1.4 mcup.mcup module

### 1.4.1 mcup.py

The core module of MCUP package.

```
class mcup.mcup.Measurement (x=None, y=None, x_err=None, y_err=None)  
Bases: object
```

An example docstring for a class definition.

```
evaluate_params (iter_num=None, rtol=0.0001, atol=0.0001, num_diff=False)
```

```
set_data (x=None, y=None, x_err=None, y_err=None)  
[summary]
```

**Parameters**

- **x** (*[type], optional*) – [description]. Defaults to None.
- **y** (*[type], optional*) – [description]. Defaults to None.
- **x\_err** (*[type], optional*) – [description]. Defaults to None.
- **y\_err** (*[type], optional*) – [description]. Defaults to None.

**Raises**

- **AssertionError** – [description]
- **AssertionError** – [description]

```
set_function (fun, params)
```

## 1.5 mcup.pee module

### 1.5.1 pee.py

Parameter error estimator functionality.

```
mcup.pee.parameter_error_estimator (fun, x_data, y_data, x_err, y_err, w_0, iter_num=None,  
rtol=None, atol=None, method=None, jac=None,  
hess=None, hessp=None, bounds=None, constraints=(),  
tol=None, callback=None, options=None)
```

This function takes input data and input error and than samples in each iteration data from given normal distribution. Input function fun will be used in the definition of cost function for least squares. Cost functions is

optimized using `scipy.optimize.minimize` function. Argument `iter_num` or `rtol`, `atol` has to be set in order to run least squares.

#### Parameters

- **fun** ([*type*]) – [description]
- **x\_data** ([*type*]) – [description]
- **y\_data** ([*type*]) – [description]
- **x\_err** ([*type*]) – [description]
- **y\_err** ([*type*]) – [description]
- **w\_0** ([*type*]) – [description]
- **iter\_num** (*int*, *optional*) – [description]. Defaults to 1000.
- **method** ([*type*], *optional*) – [description]. Defaults to None.
- **jac** ([*type*], *optional*) – [description]. Defaults to None.
- **hess** ([*type*], *optional*) – [description]. Defaults to None.
- **hessp** ([*type*], *optional*) – [description]. Defaults to None.
- **bounds** ([*type*], *optional*) – [description]. Defaults to None.
- **constraints** (*tuple*, *optional*) – [description]. Defaults to ().
- **tol** ([*type*], *optional*) – [description]. Defaults to None.
- **callback** ([*type*], *optional*) – [description]. Defaults to None.
- **options** ([*type*], *optional*) – [description]. Defaults to None.

## 1.6 mcup.utils module

### 1.6.1 utils.py

Utilities for the package.

`mcup.utils.local_numpy_seed(seed)`

Set temporal seed for numpy package with local scope.

**Parameters** **seed** ([*int*]) – Seed for numpy package.

## 1.7 Module contents

`__init__` file for project.





## CHAPTER 2

---

### Indices and tables

---

- `genindex`
- `modindex`
- `search`



### m

- `mcup`, [3](#)
- `mcup.config`, [1](#)
- `mcup.data_generator`, [1](#)
- `mcup.mcup`, [2](#)
- `mcup.pee`, [2](#)
- `mcup.utils`, [3](#)



## A

`add_noise_x()` (*mcup.data\_generator.DataGenerator*  
*method*), 1

`add_noise_y()` (*mcup.data\_generator.DataGenerator*  
*method*), 1

## D

`DataGenerator` (*class in mcup.data\_generator*), 1

## E

`evaluate_params()` (*mcup.mcup.Measurement*  
*method*), 2

## L

`linear_fun()` (*in module mcup.config*), 1

`local_numpy_seed()` (*in module mcup.utils*), 3

## M

`mcup` (*module*), 3

`mcup.config` (*module*), 1

`mcup.data_generator` (*module*), 1

`mcup.mcup` (*module*), 2

`mcup.pee` (*module*), 2

`mcup.utils` (*module*), 3

`Measurement` (*class in mcup.mcup*), 2

## P

`parameter_error_estimator()` (*in module*  
*mcup.pee*), 2

## S

`set_data()` (*mcup.mcup.Measurement method*), 2

`set_function()` (*mcup.mcup.Measurement method*),  
2