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# **chlamys**

***Release 0.2.0***

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# CHAPTER 1

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## Overview

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Smooth interpolation on scattered data with levels and slopes.

- Free software: MIT license

## 1.1 Installation

```
pip install chlamys
```

## 1.2 Documentation

<https://chlamys.readthedocs.io/>

## 1.3 Development

To run the all tests run:

tox
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Note, to combine the coverage data from all the tox environments run:

Windows	<pre>set PYTEST_ADDOPTS=--cov-append tox</pre>
Other	<pre>PYTEST_ADDOPTS=--cov-append tox</pre>

## CHAPTER 2

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User guide

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### 3.1 chlamys

`chlamys.plane` (*xi*, *points*, *values*)

Planar interpolation on a simplex

Interpolation via an D-dimensional plane given D+1 points of a simplex.

**Parameters**

- **xi** (*tuple of 1-D array, shape (M, D)*) – Points at which to interpolate data.
- **points** (*ndarray of floats, shape (D+1, D)*) – Data point coordinates.
- **values** (*ndarray of floats, shape (D+1,)*) – Data values.

**Returns** *ndarray* – Array of interpolated values.

`chlamys.cubic_patch` (*xi*, *points*, *values*, *grad*)

Cubic patch interpolation on a simplex

Interpolation via an D-dimensional cubic polynomial given D+1 points of a simplex and their gradients.

**Parameters**

- **xi** (*tuple of 1-D array, shape (M, D)*) – Points at which to interpolate data.
- **points** (*ndarray of floats, shape (D+1, D)*) – Data point coordinates.
- **values** (*ndarray of floats, shape (D+1,)*) – Data values.
- **grad** (*ndarray of floats, shape (D+1, D)*) – Data gradients.

**Returns** *ndarray* – Array of interpolated values.

`chlamys.interp_levels` (*points*, *values*, *xi*)

Linear Delaunay interpolation

Interpolation on D-dimensional scattered points via Delaunay triangulation and planar interpolation.

**Parameters**

- **points** (*ndarray of floats, shape (N, D)*) – Data point coordinates.
- **values** (*ndarray of floats, shape (N,)*) – Data values.
- **xi** (*tuple of 1-D array, shape (M, D)*) – Points at which to interpolate data.

**Returns** *ndarray* – Array of interpolated values.

`chlamys.interp_1st_order(points, values, grads, xi)`  
1st-order cubic Delaunay interpolation

Interpolation on D-dimensional scattered points via Delaunay triangulation and cubic interpolation with gradient information.

**Parameters**

- **points** (*ndarray of floats, shape (N, D)*) – Data point coordinates.
- **values** (*ndarray of floats, shape (N,)*) – Data values.
- **grads** (*ndarray of floats, shape (N, D)*) – Data gradients.
- **xi** (*tuple of 1-D array, shape (M, D)*) – Points at which to interpolate data.

**Returns** *ndarray* – Array of interpolated values.

## CHAPTER 4

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### Indices and tables

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## C

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