skfda.preprocessing.registration.to_srsf

skfda.preprocessing.registration.to_srsf(*fdatagrid*, *eval_points=None*) [source]

Calculate the square-root slope function (SRSF) transform.

Let $f_i : [a, b] \to \mathbb{R}$ be an absolutely continuous function, the SRSF transform is defined as

$$SRSF(f_i(t)) = sgn(f_i(t))\sqrt{|Df_i(t)|} = q_i(t)$$

This representation it is used to compute the extended non-parametric Fisher-Rao distance between functions, wich under the SRSF representation becomes the usual $\mathbb{L}^2$ distance between functions. See [SK16-4-6-1] .

Parameters:
- **fdatagrid** (`FDataGrid`) – Functions to be transformed.
- **eval_points** – (array_like, optional): Set of points where the functions are evaluated, by default uses the sample points of the fdatagrid.

Returns: SRSF functions.

Return type: `FDataGrid`

Raises: `ValueError` – If functions are multidimensional.

References

[SK16-4-6-1] Srivastava, Anuj & Klassen, Eric P. (2016). Functional and shape data analysis. In *Square-Root Slope Function Representation* (pp. 91-93). Springer.