skfda.preprocessing.registration.from_srsf

`skfda.preprocessing.registration.from_srsf`(*fdatagrid, initial=None, *, eval_points=None*)
[source]

Given a SRSF calculate the corresponding function in the original space.

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 transformation is a mapping up to constant. Given the srsf and the initial value the original function can be obtained as

$$f_i(t) = f(a) + \int_a^t q(t)|q(t)|dt$$

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 [SK16-4-6-2] .

Parameters:	**fdatagrid** (`FDataGrid`) – SRSF to be transformed. **initial** (*array_like*) – List of values of initial values of the original functions. **eval_points** – (array_like, optional): Set of points where the functions are evaluated, by default uses the sample points of the fdatagrid.
Returns:	Functions in the original space.
Return type:	`FDataGrid`
Raises:	`ValueError` – If functions are multidimensional.

References

[SK16-4-6-2] Srivastava, Anuj & Klassen, Eric P. (2016). Functional and shape data analysis. In *Square-Root Slope Function Representation* (pp. 91-93). Springer.