THE REGISTRATION CODE - NOTES

1. The overall code

We refer to the fine `Main.m`

1.1. Parameters to be chosen.

- `startmode`: is set to `'zero'`. If set to `'multiscale'` the initial guess for the computation is loaded from a file saved from a previous run of the code on a lower resolution version of the same image. NOT RELEVANT
- `j`: Image level
- `nrefine`
- `cost_function`: decides which cost function to use. Admissible values are `'LS'` (least squares) and `'WNRMSE'`
- `Kmi`, `Nsample`: parameters only relevant to the MI cost functional. NOT RELEVANT
- `maxit`: maximum number of iteration for the optimization algorithm
- `noise_type`: type of noise added to the template. NOT AVAILABLE IN OCTAVE
- `nome_immagine`: drives the name of image to be loaded. It will not be relevant when we load a different image
- `D`: selection of the average interpolating basis for the image model. DO NOT MODIFY
- `nw`, `j0`, `jwi`: selection of the interpolating basis for the transformation.

2. The image model

The image "lives" on a grid `griglia` (which is basically the grid of the centers of the pixels), and `h` is the size of the pixel. There are 3 different ways of interpolating and differentiating the image.

- `'cubic'`: the image is interpolated with a centered bi-cubic interpolation
- `'AI'`: the image is described by average interpolating basis functions
- `'BSpline'`, `'Spline'`: NOT AVAILABLE IN OCTAVE

Observe that for practical reasons, the image is reordered as a vector by the function `matrix2vector`. The function `vector2matrix` performs the inverse operation.

3. The transformation

The transformation is based on Donoho's interpolating wavelets. The transformation space is selected by choosing the following parameters:

- `nw`: this parameter identifies the order of the interpolating function. For `nw`= 1 the space coincides with the space of piecewise bilinear functions on a structured tensor type mesh.
- `j0`, `jwi`: the mesh size for the function space describing the transformation is $2^{-\texttt{jwi}}$. The transformation space allows for a hierarchical structure with coarse level `j0` and fine level `jwi`

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