

Model-Based Objective Function: *Pseudo-code*

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These notes are intended to ease technical implementation being intercommunicated. *Emphasise style* is used to symbolise more significant I/O steps which can be ignored.

Stage 1

- Generate data or retrieve it from file.
 - ◆ Apply data smoothing if required.
 - ◆ *Save data as images if requested by the user.*
- Choose data reference. By default, data instance which is closest to the mean is selected.

Stage 2

- Find the target of registration where alignment is said to have been determined.
 - ◆ Align all data using a piece-wise linear warp if required.
 - ◆ Perturb the data if required, distancing it from the correct solution.
- *If necessary, save data to file.*
- Apply intensity offset if required. Intensity offset forces all peaks to equate in height.

Stage 3

- For all registration iterations:
 - ◆ Set the level of precision for the optimiser to reach. At present it increases as registration proceeds, but ideally it should increase when the improvements made are small.
 - ◆ For all data instances:
 - If the current data instance is not a reference:
 - ★ Set up the positions of knot-points. Currently random placements with a sensible distribution are made.
 - ★ Given the knot-points positions, apply warps to the current data instance and seek the warp parameters which minimise the cost $f(x)$, where x is the complexity of the model built from the entire set of data.
 - end if
 - ◆ end for
- end for
- *Statistics and registration logging take place.*