Progress Report Submission
for C. J. Taylor

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Agreed Upon

Technical

- Continue on-going work constructing an objective function based on Tim's paper. Try normalising the shapes to avoid bumps from shrivelling and force one image to be a reference (despite the fact that such a strategy is not explicitly mentioned in Tim's paper).

- Incorporate into evaluation methods a log-dependent score of appearance models. This will better depict order of magnitude changes.

- For comparative analysis, plot a dashed line which represents the perfect model's score.

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Organisational

- Ask Jim about MATLAB compiler licence acquisition in ISBE.

- Inquire about Acrobat Pro Licencing in the University.

- Take the Mathematical Methods course.

- Look for a Web-based EndNote interface.

- Send figures with some results by E-mail when this appears necessary.

*P*rogress Made

- Wavelet briefly explored and studied. The only foreseen problem is that the MATLAB libraries in the Department of Computer Science exclude the wavelets toolbox.

- Menus have been extended to include opening and saving. This allows the exchange of data for testing purposes, e.g. the application of Carole's algorithms to synthetic bumps. Inter-operative comparison of algorithms is greatly eased by such feature which exports and imports binary data.

- Splash screen constructed as AART requires nearly 5 seconds to start on a modern computer.

AART splash screen

- The objective function option which iteratively tries all existing schemes can now produce overlaid plots (confer Appendix). Various other issues related to this option have been addressed as well.

- The target of registration can now be viewed to estimate the quality of the optimisation.

- Viewing of the warp curve is possible (see Appendix).

- Kernel types are included in the objective function that is based on Tim's work. See the appended figures for results produced by exponential PDF's[1].

- Data samples preview is more customisable. The flexibility of data generation routines is rather essential, but it results in data bias if tempered too frequently.

- Tim provided some help with PDF-based objective functions and he will soon deliver a copy of his lecture notes. The book from Pass *et al.* would be a substantial learning component too.

- Sum of log of model Eigenvalues has been added as an evaluation option (See E-mail with figure attachment from February 10th).

- E-mail regarding my EPSRC status has been forwarded for confirmation to be sent to Surrey. This still needs to be assured that the confirmation was received (see E-mail from February 10th).

- Richard Stephenson has been contacted regarding licencing issues. He is glad to receive any further suggestions (See detailed E-mail from February 10th).

- Dual-head display on Linux was finally arranged on Monday. It has resulted in increased productivity thus far.

- The Application's Web site includes several new screen-shots, but the content was not noticeably extended. Help and reference files will be added when development becomes largely static.

- No EndNote access-point via the World Wide Web could yet be found. References are (still) transported primarily by E-mail.

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[1]Many other possibilities are available, including a Gaussian one. These are no longer pursued because functional completeness is not a top priority.

Next Stage

- Continue extending the functionality of the application and use it to infer new knowledge and focus effort accordingly.

- Discuss the potential of wavelets for the evaluation of group-wise complexity.

- See the MATLAB experiments and results in the next section and contemplate the next steps.

- Agree on some data standardisation for a more precise definition of the conditions under which benchmarking is to proceed.

- Find out if there are prospects for newsgroup/s to replace ISBE-all and be used for occasional announcement which are less urgent. *man.isbe* on Usenet is available and a proposal needs to be sent to MIT for this to become possible.
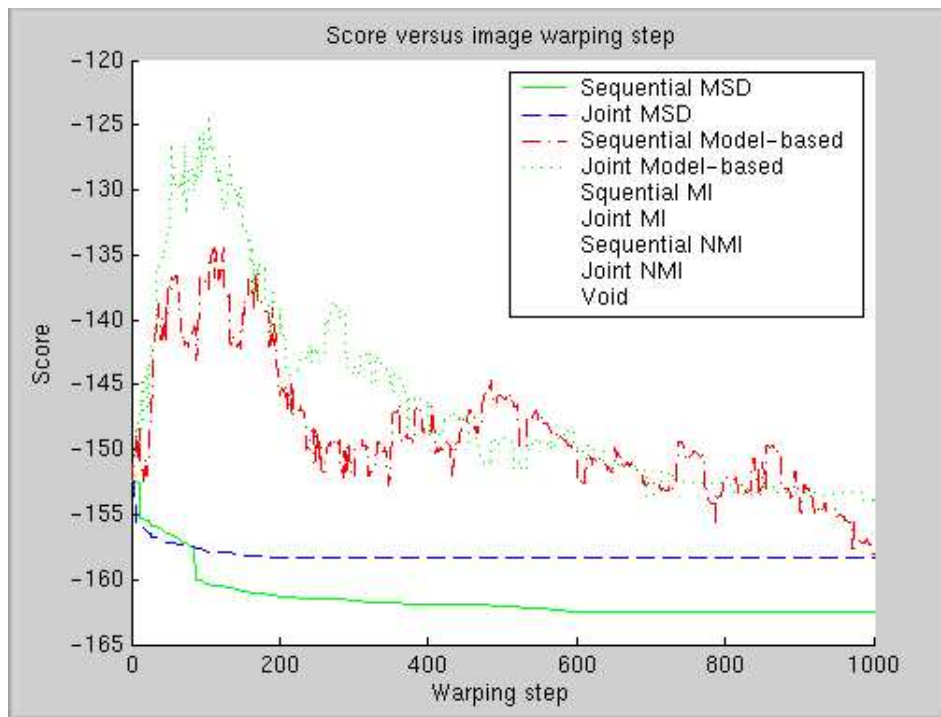
Appendix

In all the following, single-point CPS with random scale and orientation placement must be assumed.
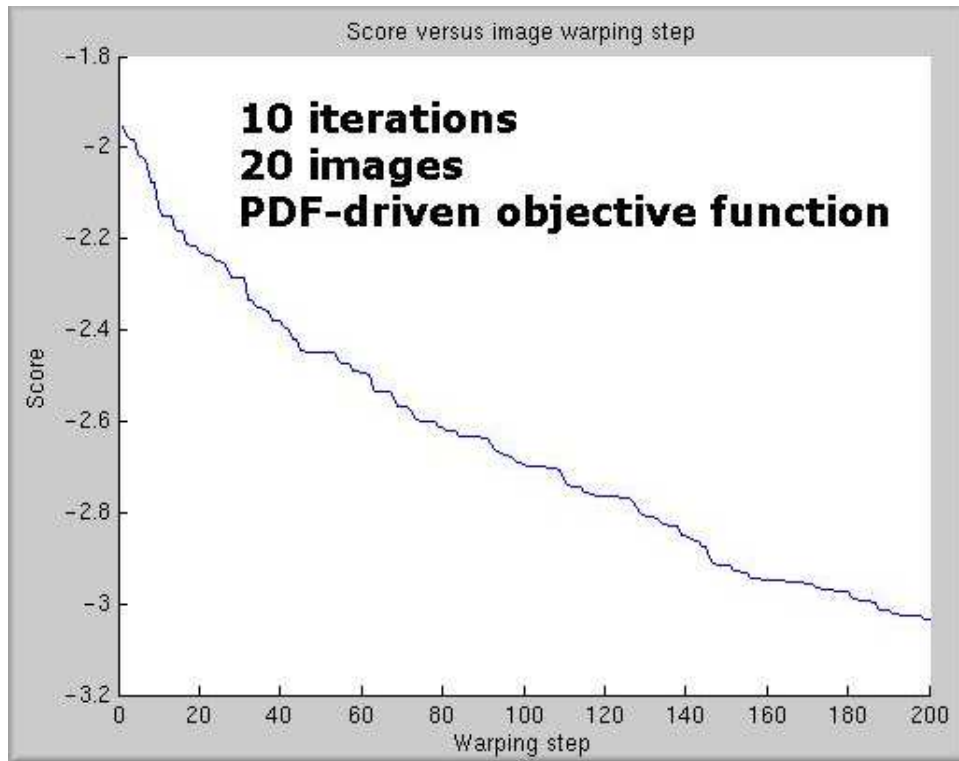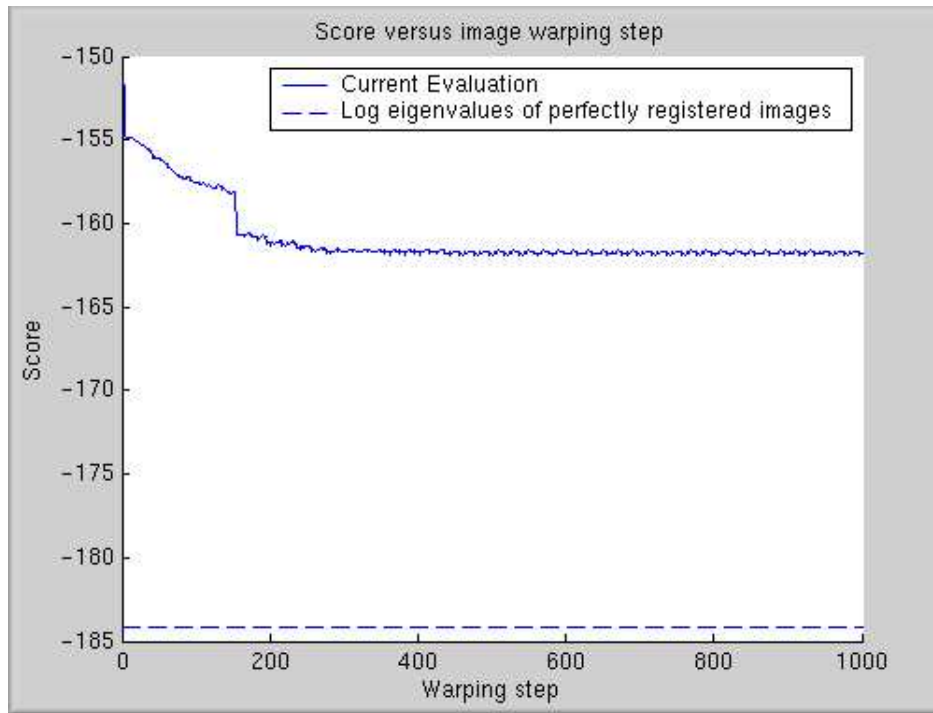
The good optimisation characteristics of a function based on an
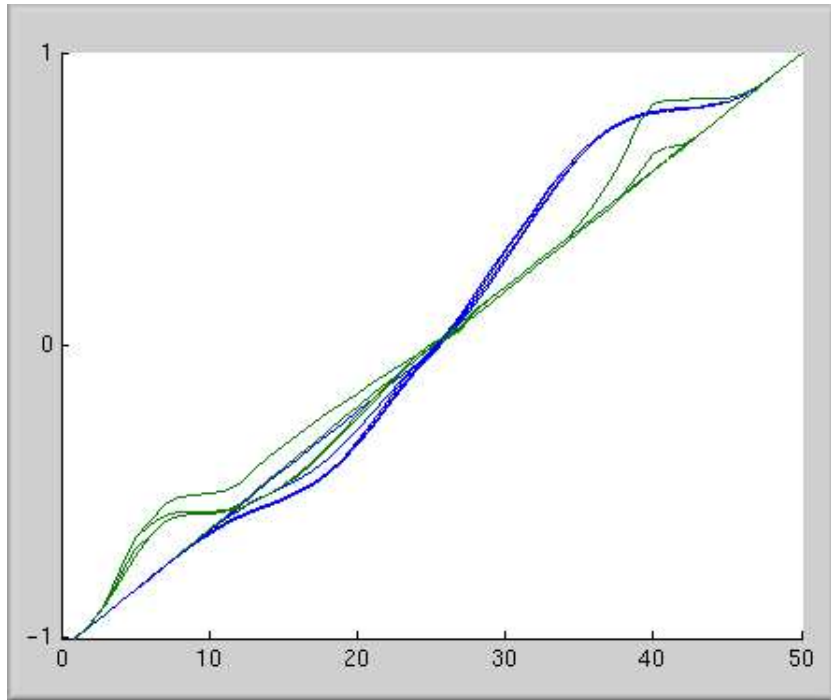exponential PDF.
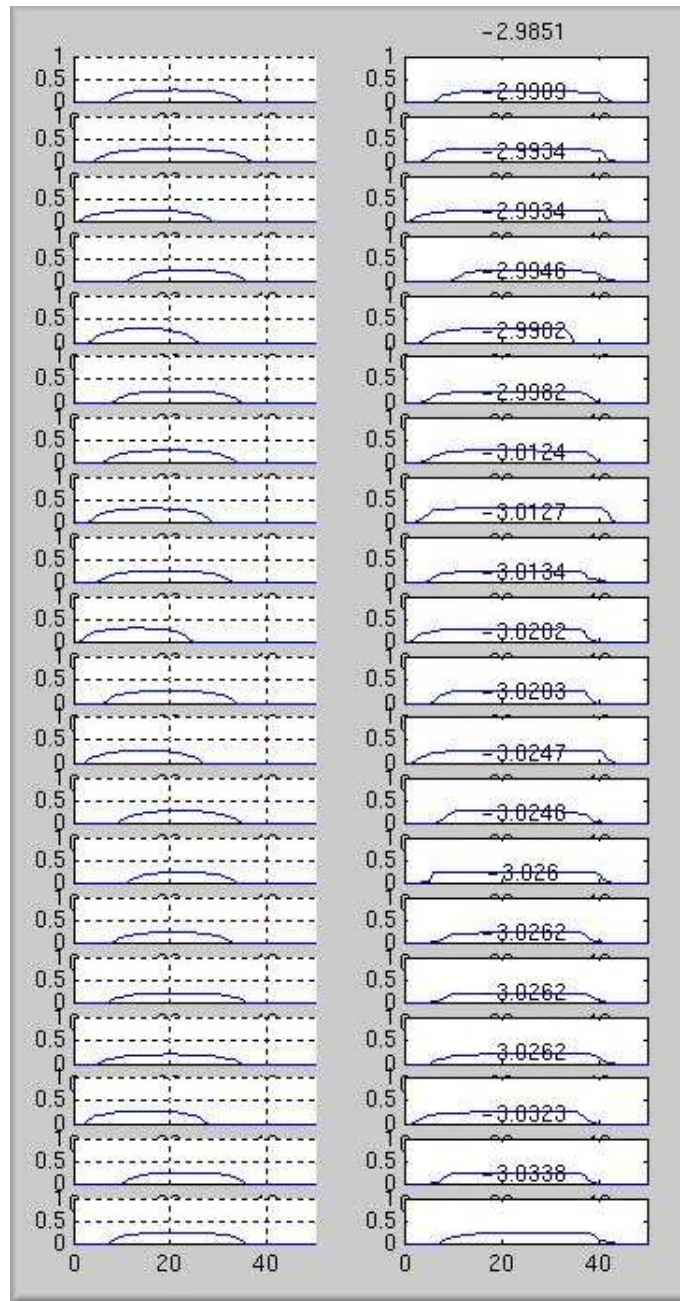
The visual results of warps applied by the aforementioned technique.

Most optimisation techniques overlaid and evaluated using
appearance models (50 iterations, set size 20)

The optimisation of the joint model-based objective function and its
target (50 iterations, set size 20)

Deformation warp curve