- You will be writing algorithms to minimise various cost functions and will be designing mechanisms for inputting data and viewing data. You will be considering how to describe the quality of your resulting model and how to describe the limits on performance to a potential user (the recipient of your image).
- Your report is to focus on the technical aspects of the design of the algorithms you propose to use, and how you have tested and characterised their performance limitations. Imagine that your report is the technical white paper underpinning a business plan to launch a new App or Web-service - the final version may not even be implemented in Matlab.
- Your code will undoubtedly need a GUI to input data. The GUI will not be the main focus of your report but there should be an indication of how your program inputs data and the nature of the output.
- It is important that your code is well structured and designed. Comments should be informative and be consistent with the logical structure of your solution. Assumptions that you make about input parameters and return values that reflect the correctness of the code should be highlighted by your comments. Use comments to underpin the robustness of your code to improper input.
- Check eps.
- The entire project contains the test of the optimiser as an objective. We are only inputting simulated image data and we know the answer (we complete the K-matrix before we ‘estimate’ it). The percentage of outliers, the spacing of the grid, and the noise level in the estimation of the grid corners can all be varied to determine how the code’s performance varies as these key parameters are changed. You can also change the range of angles from which the grid is viewed to see how this affects the quality of estimation.
- Stopping criterion: the minimum is reached when the gradient is small. One possible measure of ‘small’ is the norm of the vector J’e divided by the number of measurements is small. But think about the units of each of the derivatives - the unscaled measurement is in pixels and the units used for the parameters are pixels, radians, and millimeters, so the derivatives are pixels per pixels, pixels per radian, and pixels per millimetre. You may wish to weight the elements of the derivative before computing the norm. Some discussion of the stopping criterion will be looked for in your report. This consideration is another advantage of scaling. Note that calculating the norm is very expensive.
- But in our case the Jacobian as a specific block structure can be used to speed up computation. The code is aimed at the task of estimating a K-matrix. I have also used a simple stopping criterion. Do you think the stopping criterion is appropriate? Why did I divide by the number of images? What is actually being tested here? Can you think of other termination conditions that might be better (how about the infinity norm - and how do you compute it?)

Report is to focus on optimisation , a potential GUI of the program, discussion of how it was programmed, commenting, input checks

This is a reminder about the B1 project administration. Please read the following information carefully as it includes important information and guidance.

Firstly, we want to remind you that you will no longer be able to get help with your code from the academics or demonstrators after the end of Michaelmas Term. Of course, if something is unclear in the project brief or similar, you can ask about this but no further help on your code will be available so it is important that your code is in good shape **by the end of this week** (Friday 2ndDecember).

Secondly, a reminder about the submission of your report. One copy of the B1 report must be submitted to the Chairman of the Examiners, Honour School of Engineering Science, c/o Clerk of the Schools, Examination Schools, High Street, Oxford, by **noon on Wednesday of Week 1 in Hilary Term** at the latest (Wednesday 18 January 2017). **This is a strict deadline which must not be missed.**

The project report must not exceed ten pages (including all diagrams, photographs, references and appendices). All pages must be numbered, have margins of not less than 20mm all round and typeface of Arial 11pt font with double-line spacing. The report must be the candidate's own work and should include a signed statement to this effect. A declaration of authorship form must be completed for each student contributing to the report and a copy is available on WebLearn <https://weblearn.ox.ac.uk/x/jjAVnH> with all other B1 project documentation. The declaration must be submitted with the report but not attached or bound into the report to allow for easy removal prior to submission to the assessor. Neither the declaration or title page are included in the page count.