Question 1.

Part a) Most people answered this well, although some precision was missing. When it came to possible problems with the given images, most people remembered the key points and made good suggestions.

Part b) There were some excellent answers to this part, and many people spotted that rotation might not be needed for alignment. But many people also forgot the Procrustes shape alignment stage entirely.

Part c) There was some confusion here between normals as used in search, and normal in terms of profile models. But there were many good answers, and most people were able to give some reasoning as to possible problems with search on these images.

Overall, the main issue was a lack of mathematical precision, or people trying to explain in prose things that could have been more precisely and more concisely (hence faster!) explained using diagrams, sketches, pseudo-code, pseudo-equations etc. I wasn’t expecting essays.

Question 2.

For part a), there were some good answers, but many people failed to provide enough detail as to the EXACT operation(s). Also, many people failed to note the specific reference to BINARY images, hence operations such as erosion/dilation combined to give opening closing and what these might be useful for. No one mentioned the top-hat transform, despite the coursework on it!

Part b) People who attempted this part, mostly got full marks (because no one tried guessing a result because they couldn’t remember how to do a convolution! )

BUT what almost everybody missed here was the link between Part b) and Part c). HENCE was there for a reason.

Part c) There were some good answers to this question, but also a lot of answers which just reproduced everything they could remember about edge detectors. What was missing in almost all answers was the complete line of reasoning as to why first and second-derivative filters were needed. Indeed, in an alarming number of answers, I was not totally sure if the candidate knew what a derivative was, and certainly many people seemed to be lost when it came to what the SECOND meant in second derivative. Confusion between a second derivative and a Gaussian arose several times (I really am not clear how this came about!).

Many answers also displayed a lack of precision.

Part d) Many people recalled the diagrams from lectures here, which was encouraging.

Overall, for this question, the main failings were a lack of precision and detail. In particular, prose answers without diagrams had a harder job of getting the required precision and detail for full marks.

Although most people remembered bits and pieces correctly, what was noticeably lacking in many cases was putting this information in a wider context.

Question 3.

Overall, most students did well in this question. In some answers, interest points were confused with local features. Most students realised that they can use a bag of words model to detect motorbikes in an image however some answers lacked in precision and detail.

Question 4.

Again, good answers overall. Some students proposed EM with Gaussian mixtures as an alternative algorithm HOWEVER this would not work well in this case. Since K=2, a model of two gaussians would not be able to handle outliers for the data shown in the diagram.