**IAI-CV Demo Assessment**

**Monday 22nd April**

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| **Name** |  | **Time** |  | **Marks (10)** |
| Pooni, Sukhjit  Playing Cards | MS | 14:00 | Colour to segment card and partially recognize suit. Used colour SD ratio. Re-segment using the Bradley method. Was this a re-segmentation. Justify the need to re-segment and explain what the Bradley segmentation is. Used pixel count in top 2 or 3 rows of patch around suit icon. Used dilation on centre patch to ID face and number cards. There are several methods that could have improved on this: colour histogram size distribution of blobs.  Explain carefully what you have done and why. Evaluate further, in particular segmentation method, and comment critically on results. Comment on what you might have done to improve reliability.  How could you make the operation less sensitive to lighting? | ~~DP: 6~~  ~~MS: 7~~  Final: 7 |
| Peel, Luke  Playing Cards | MS | 14:20 | Some aspects were not well explained. Affine transform from Aforge.net again. ID J, Q, K using templates after a histogram. Used side length of fitted square to differentiate diamond and heart This seemed a little adhoc. Could perhaps have been better explained. Used average colour to confirm suite. Why was this necessary? Confuses spades and clubs. Need to evaluate and reduce sensitivity to lighting. | ~~DP: 6~~  ~~MS: 6~~  Final: 6 |
| Bishnoi, Sharash  Playing Cards | MS | 14:40 | Good presentation. Used Canny to find outline of card and features. Detected corners to fit rectangles. Used colour to partially distinguish card suit. Count of pixels at top bottom and middle of suit icon to differentiate diamond and hearts. Likewise J, Q and K. You have used simple methods which seem to work. That is good. Good use of debugging windows.  Need quantitative evaluation.  Explain what was done and what comes from a library. | ~~DP: 6~~  ~~MS: 6.5~~  Final: 6 |
| **Name** |  | **Time** |  | **Marks (10)** |
| Crooks, Samuel  Playing Cards | MS | 15:00 | Some aspects of your system were not presented clearly and you glossed over a lot of detail.  There was a lack of robustness. It was not clear how the rectangle was formed from the four corner points. Did you use the affine transform function ? You should explain the OpenCV function that does this. Background subtraction. Locate blobs and template match.  You must explain what code you wrote yourself and which functions from OpenCV have been used.  Need to evaluate and improve segmentation.  Explain what was done and what comes from a library. | ~~DP: 5~~  ~~MS: 5.5~~  Final: 6 |
| Gu Yifan  Pedestrian Detection | DP | 15:20 | NO –prior discussion with DP.  Appears to use standard Grimson paper on tracking. Need to be able to explain what is done clearly. The explanation given was unsatisfactory. You need to decide how to evaluate and perform evaluation. Simply implementing a standard method with calls to library functions will never lead to a high mark.  You need to evaluate your work using a range of input video. | ~~DP: 4~~  ~~MS: 4~~  Final 4 |
| Fang Rui  Pedestrian Detection | DP | 15:40 | No prior discussion with DP.  Note that in English (as opposed to American) modelling has two l’s. There were far too many words on some slide.  Described subtraction of average background, subtract and remove artefacts with erosion and dilation (opening). Used GMM background modelling and a Kalman Filter.  You need to be able to explain the method. This seems to be a number of OpenCV functions used without evidence of understanding, as a black box. You must be able to explain how the Kalman Filter was applied. A generic description will not suffice.  Need to evaluate performance. Can you optimise the parameters? | ~~DP: 4~~  ~~MS: 4~~  Final: 4 |
| **Name** |  | **Time** |  | **Marks (10)** |
| Feng Yueting  Dimensional Gauging | DP | 16:20 | I do not understand how multiple views would be used. The task was a clearly specified but this does not appear to address the task set. What do you mean by undistort ? I suspect you mean perform an affine transformation but I am not certain. I think you when transform from an oblique view to a planar view.  Starting with a planar view is more appropriate. You have chosen to use a provided function to get the corner pixel to sub-pixel accuracy. That is ok but corner detectors are usually differential operators. They emphasis noise and do not naturally lead to sub-pixel enhancement. You use the Canny operator but it is not clear why. Also the “double threshold” appears to be the same as the threshold with hysteresis. Explain the sub-pixel corner detector  You demonstrated results at pixel and sub-pixel accuracy but could not explain how you obtained the pixel accuracy results. This is essential. The sub-pixel results and the calibration factor were quoted to very high levels of accuracy. You need to justify the accuracy of the results. A calibration factor with 13+ decimal places is not credible in this case. A measurement, corner to corner to a sub-pixel accuracy of 6+ decimal places is not credible either.  You also need to perform evaluation. Measure the dimensions manually several times to obtain an accurate measurement. Compute the SD of the sub-pixel measurement to estimate its repeatability. You could reduce the image resolution and prove that you get the same result with the sub-pixel method on the reduced resolution image as with a pixel accurate method on the higher resolution image.  You also need to explain the method and results carefully. | ~~DP: 4~~  ~~MS: 4~~  Final: 4 |
| **Name** |  | **Time** |  | **Marks (10)** |
| Folorunsho, Opeyemi  Character Identification | DP | 16:40 | Your powerpoint had a very small diagram on the second or third slide. Use the full slide area and sensible font sizes. This comment was made wrt the EDSP presentation. Do not repeat the error for the project.  You described using the Otsu threshold and training to recognise characters. The training set was included in the test set. This is a very optimistic test. You need more training and test data. Consider what to test. Perhaps scale invariance, rotation invariance, recognition. With variations of font.  You could compare boundary, region and grey-level moments.  Describe contour tracing and moment computation. | ~~DP: 5~~  ~~MS: 6~~  Final: 5 |
| Xu, Guangiao  Playing Cards | MS | 17:00 | You used simple methods to good effect. Well done. The presentation was mainly very clear. There were some good ideas.  You identified the card orientation and rotated it. The method slide, second slide I think, showed a chain of steps with number vers picture card ID. The remaining steps were concerned with picture card ID. Nothing identified how the card number was identified nor that it was done. The id of picture cards was simple and clear. The method to ID diamonds and hearts suit was simple and clear as was the spades vers clubs method. ID of J, Q, K seems ok. Be sure to describe divisions of symbol patch. Is it necessary to split into a 3 x 3 and a 2 x 2 set of patches? Consider if the logic to identify J, Q, K is what you really want. I think it could be simplified. How well separated were the features that you computed? Did you have a suitable decision threshold? This is not for speed but clarity. What you described as moments is not. Chose a more appropriate name.  You need to evaluate card ID performance and might consider how you could make the segmentation more reliable. There is scope for detailed evaluation which would be a good feature of the report.  Setting parameters I not calibration. | ~~DP: 7~~  ~~MS: 8~~  Final 8 |
| **Name** |  | **Time** |  | **Marks (10)** |
| Dai Yingshuang  Face Identification | DP | 17:20 | Not discussed with DP at any point.  It appears that you have not spent any significant time on this assignment. There was very little of substance presented.  You seemed unable to explain how Eigen Faces works nor to use the functionality provided in MatLab, OpenCV or AForge.net.  You need to start by implementing a simple method of template matching using cross-correlation. The definitive method is that introduced by Alex Pentland.  Read this paper and talk with me or Dr Spann.  You have much to do to avoid a resit. | ~~DP: 1~~  ~~MS: 1~~  Final: 1 |
| Obazele  Face Location | DP | 17:40 | Black text on medium to dark blue is low contrast and hard to read. Some slides had a great deal of very small text. Otherwise the explanation was clear.  You could investigate the use of opening and closing further. Check out the reference to the paper on skin tone detection on WebCT.  Repeat the processing in the windows to identify separate heads and eliminate knees etc. You could re-process, perform an ultimate erosion and grow each left point in turn, erode until you get two blobs and grow each one back in turn. Re-evaluate and write up with careful explanations. | ~~DP: 6~~  ~~MS: 6~~  Final 6 |

**Tuesday 26 April, 2013**

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| **Name** |  | **Time** |  | **Marks (10)** |
| Ahmed Marsuik, Mohamed  Number Plate Recognition | MS | 13:40 TBC | Mainly clear presentation.  Median to remove noise. Check if it is really a significant improvement. Locate regions with Findcontour following edge enhancement.. Using size ratios and looking in bottom half of image for number plate.  Select characters as 0.6 – 0.9 height of number plate. Have to put character patches in order. Locate characters by template matching. Differencing to match image of character o template. Confuses Y and V. Consider additional tests to resolve. Problems with lighting. Need to evaluate more extensively and with more images.  Good presentation. The system is based on the openCV function to determine contours. Make sure you explain how this works. Various simple methodologies applied which combine to work well. Evaluation required to see how much the image can deviate from the ‘ideal’ and your system still works. | DP: 6  MS 7  Final 7 |
| Male, Thomas  Malinder, John  Face Location | MS | 14:00 | Good understanding, clear presentation. Good understanding of smoothing and morphology.  Might be better with a careful use of skin tone with template matching. Need more evaluation. Good update of template.  V good.  Excellent piece of work and a very good demonstration. Lots of novelty in your solution. Just make sure you write it up well and include a full evaluation. | ~~DP: 8~~  ~~MS 9~~  Final ? |
| Sim, Leon Han  Ye, Nan  Playing Cards | MS | 14:20 | Locates card if mainly square to image and aligned with X-axis or Y-axis. Also ok with small tilt forward.  Template match of whole card. No use of colour.  Need to join the two programs, use colour interp. Evaluate. Much to be done.  Not clear why you need all 3 HSV channels to filter out the card image. How sensitive is it to the thresholds you set. Using template matching across the whole card is simplistic and lacks robustness. You need to look at a more local method. | DP: 4  MS: 4  Final: |
| Mavlenov, Syrymzhan  Face Location | DP | 14:40 | Limited discussion with DP.  Skin tone to allow Haar cascade to be applied to part of image. Using library calls to OpenCV. Curious set of criteria for skin colour. Consider HSV.  Evaluate value of skin tone detection  Your system combines the openCV Haar filter with a simple skin tone filter as a pre-processing stage. You need to show that the pre-processsing step improves the face detection by more thorough evaluation. Also more details required in your report about how the Haar cascade face detector works. Your presentation glossed over some details. | ~~DP: 6~~  ~~MS: 6~~  Final: 6 |
| **Name** |  | **Time** |  | **Marks (10)** |
| Al-Ghafri, Ahlam Saif Khamis  Face Location | DP | 15:00 | RGB vers HSV not well explained. Need to use S as well as H.  Need to consider what will be measured regarding height and narrowness. Need more evaluation  You have implemented a simple system based on thresholding the H channel. More evaluation required on more than 2 images. Also you probably need 2 channels to achieve the required robustness over more images. | ~~DP: 5~~  ~~MS: 5~~  Final: 5 |
| Han, Jihoon  Face Identification | DP | 15:20 | A simple approach taken. Your system relies primarily on openCV function calls. Also I would like to see a lot more evaluation on a large number of images as to the effectiveness of the simple 3 element feature vector. How good is it for separating faces? You could make a good quantitative evaluation here. Use a simple classifier (eg KNN) for gathering classification error statistics. | 5 |

**Friday 26 April, N305**

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| **Name** |  | **Time** |  | **Marks (10)** |
| Amran, Muhammad Hasif  Stefanowski, Marek  Playing Cards | DP | 14:00 | Good presentation. Your system is dependent on the accuracy of the thresholding. You need to consider a more adaptive approach or using colour rather than greyscale. Also your approach is not size invariant. Skeletonisation is not the best way of recognizing the picture card. There are simple geometrical or symmetry features of the K,Q and J character that can be used. | 6 |