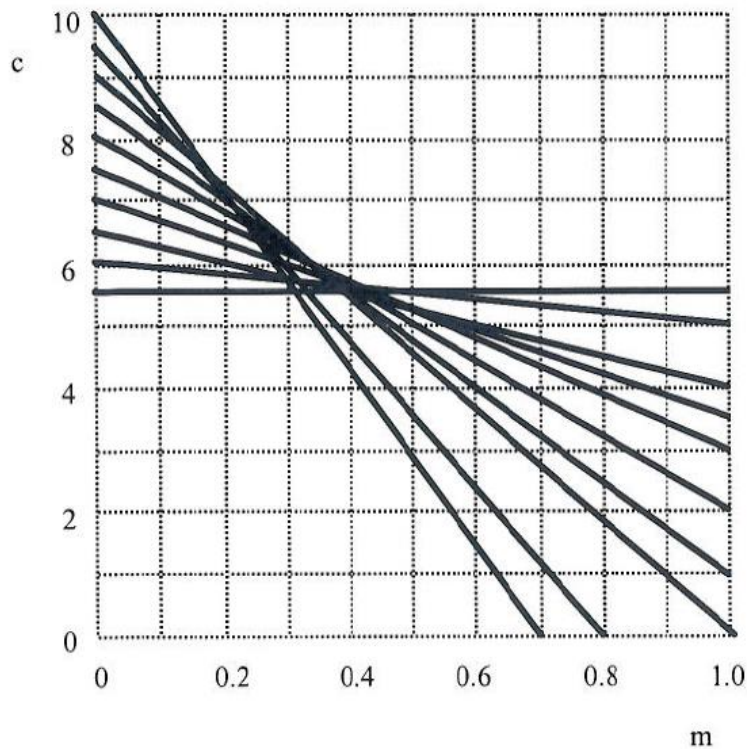**COMP70058 Computer Vision**

Tutorial 2 – Hough Transform and Fourier Methods

1.   Sketch of the corresponding lines in m-c space, using the range [0..10] for c and [0..1] for m.


The histogram array can be deduced from the above diagram. Results may vary according to your accuracy of drawing:

	0-0.1	0.1-0.2	0.2-0.3	0.3-0.4	0.4-0.5	0.5-0.6	0.6-0.7	0.7-0.8	0.8-0.9	0.9-1
9-10	2									
8-9	2									
7-8	2	6								
6-7	2	4	8							
5-6	2	2	6	10	8	3	2	2	2	2
4-5					4	5	4	3	2	1
3-4					2	2	3	3	3	2
2-3					1	2	2	2	2	1
1-2						1	2	2	2	1
0-1						1	1			1

The estimated line has m=0.35 and c=5.5 with 10 votes. There are large side lobes at m=0.25 c=6.5 and m=0.45 c=5.5, each with 8 votes.
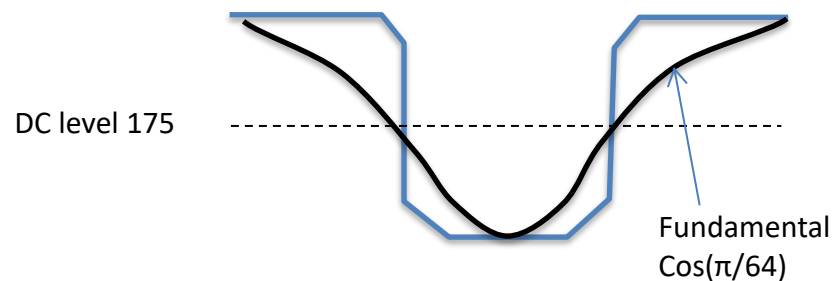
2. Process the image below (or any image you want) directly in the frequency domain as follows:
   - Create a smoothed image
   - Detect edges
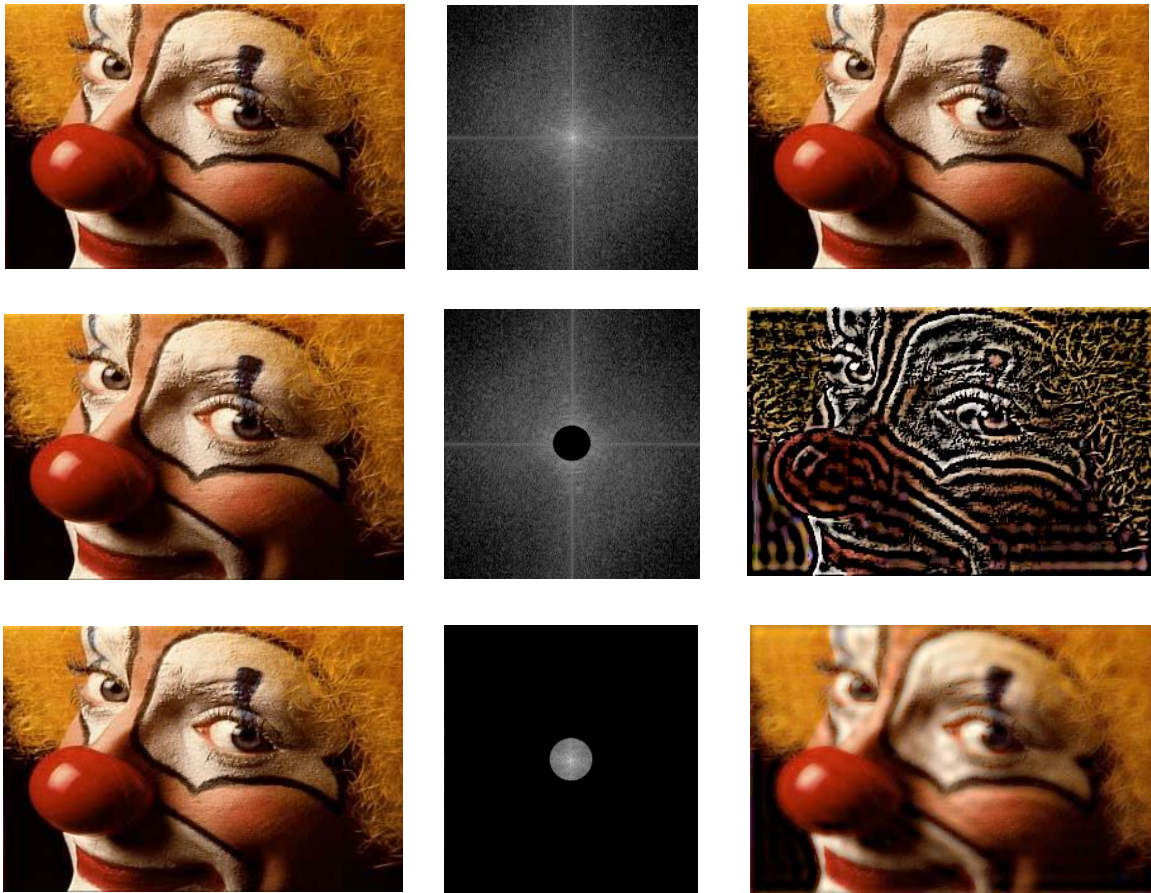
3.

a) For the fundamental, 128 pixels will correspond to an angle of 2π. Hence we have that:
$128\alpha = 2\pi$ giving $\alpha = \pi/64$.

b)

DC level 175

Fundamental $\text{Cos}(\pi/64)$

From the sketch: $a_0 = 175, a_1 = 45, b_1 = 0$