2.1 Because $x\cos\theta + y\sin\theta = \rho$, so amplitude is $\sqrt{x^2+y^2}$ and the phase is $\tan^{-1}\frac{x}{y}$.

2.2 Because if we use (m,c) to create parameter space, each image edge (xi,yi) will be a line: c = -xim+yi. The space required for m and c is too huge. The slope is $-\frac{\cos\theta}{\sin\theta}$ and the intercept is $\frac{\rho}{\sin\theta}$

2.3 $\rho_{max} = \sqrt{(1+H)^2+(1+W)^2}$ and the range of θ is [0,2π].

2.4 According to the result from Matlab, the intersection point is $(\frac{3}{4}\pi, 0)$. Correspondingly, m=1 and c=0.

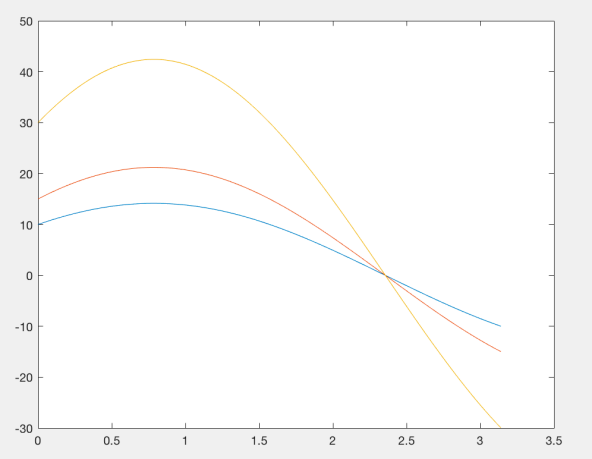

Figure1. Result From Matlab

2.5 I think the dimension of parameter space will affect the feature we detected. For example, if the dimension is three, the feature we detect may be a plane. I will still have to consider every plane where a certain point lies on. And transfer these planes to 3D sinusoid curve in parameter space. Then also use an accumulator to find the most votes intersections and then I can detect the planes on the image space.

3.6 For image1, all the intermediate images are shown below.

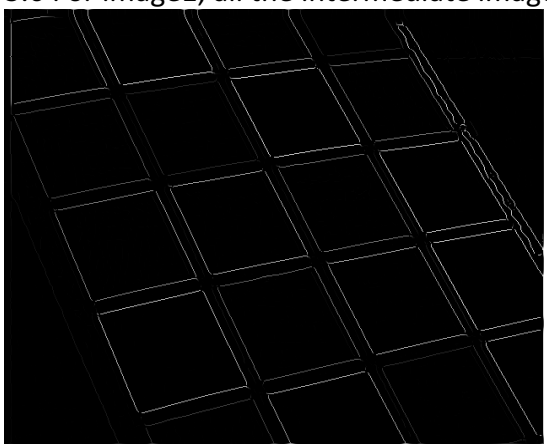

Figure2.img01_01edge

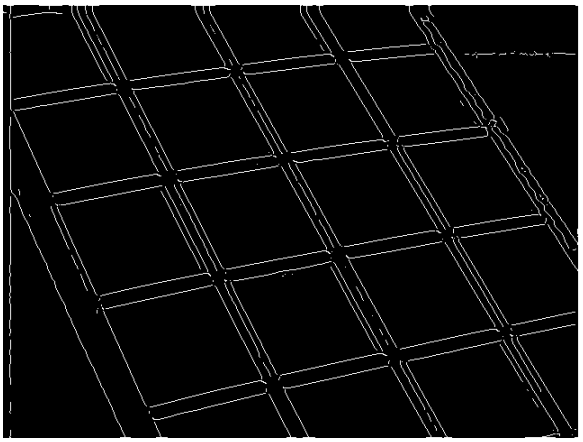

Figure3.img01_02threshold

Figure4.img01_03hough

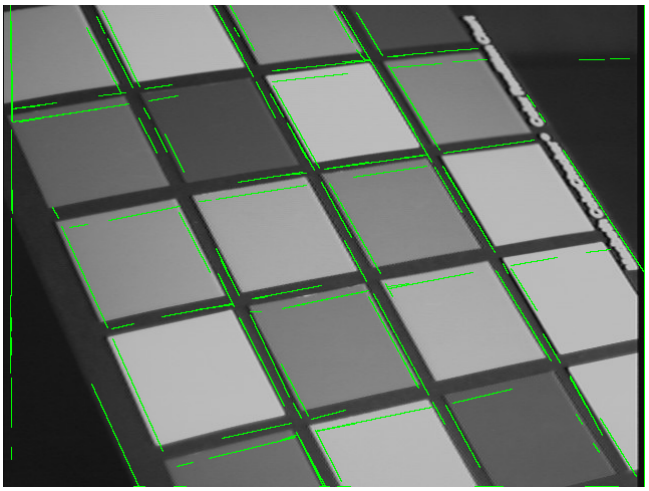

Figure5.img01_04line

4. No, it doesn't work well on some of the image like img2, img9 and img6. And for other images, there're still some bias lines.
The experiments I've implemented are shown below.

experiment	result
1. Change nlines to 25 2. Change threshold to 0.05 3. Change rhoRes to 1	Some important edges are missed.
1. Change threshold to 0.02 2. Change thetaRes to pi/45	Didn't see any change.
Change sigma to 4	Some formally ambiguous edges are also marked by green lines. I think this may be a good change.
Change rhoRes to 4	Some edges become double lines.