Detect and Measure Circular Objects in a image

```
md"""
# Detect and Measure Circular Objects in a image
"""
```

```
using FileIO,Images,ImageCore,ImageFeatures,ImageView,ImageDraw,ColorVectorSpace
```
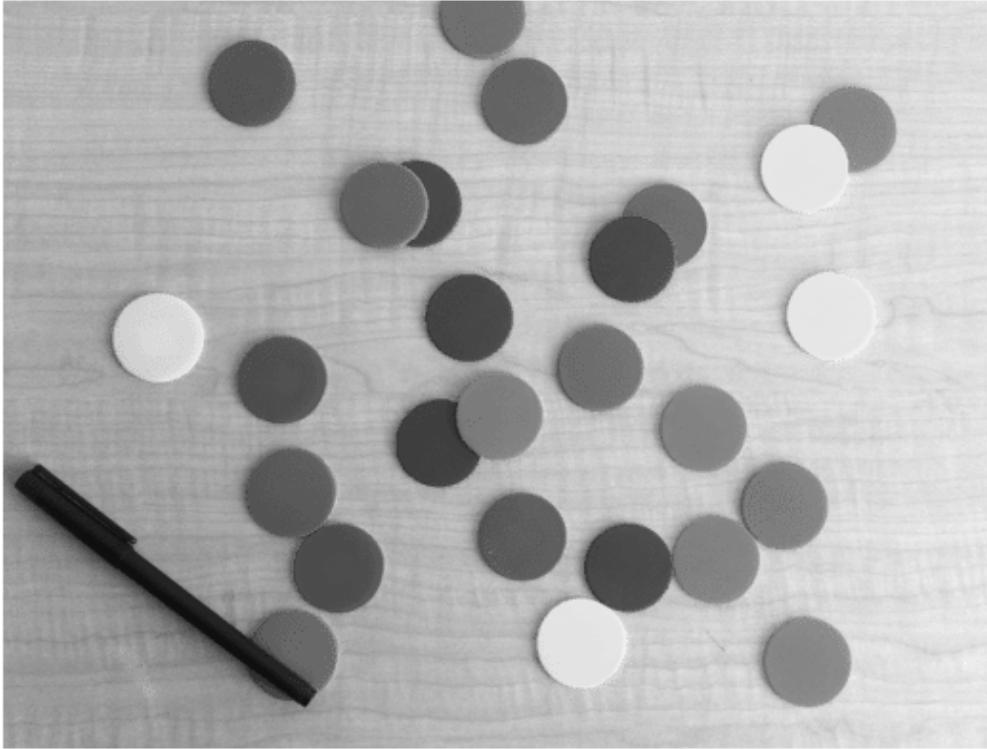
```
using Plots,ImageContrastAdjustment
```



```
begin
img = load("assets/roundchips.png"); #second way

#mosaicview(img;nrow=1) ; end
end
```

```
img_gray =
```

```julia
img_gray=Gray.(img)
```

```julia
img_edges = canny(img_gray, (Percentile(95),Percentile(85)),15);
```

```julia
dx, dy=imgradients(img, KernelFactors.ando5);
```

```julia
img_phase = phase(dx, dy);
```

```julia
centers, radii = hough_circle_gradient(img_edges, img_phase, 20:30);
```

```julia
img_demo = Float64.(img_edges); for c in centers img_demo[c] = 2; end
```

```
484×698 Array{Float64,2}:
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  …  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0     0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0     0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0     0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0     0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  …  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0     0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 ⋮                        ⋮              ⋱  ⋮                        ⋮
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0     0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0     0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  …  2.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0     0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0     0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0     0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
```

```julia
img_demo
```

```julia
using Colors
```

- `Gray.(img_demo)`

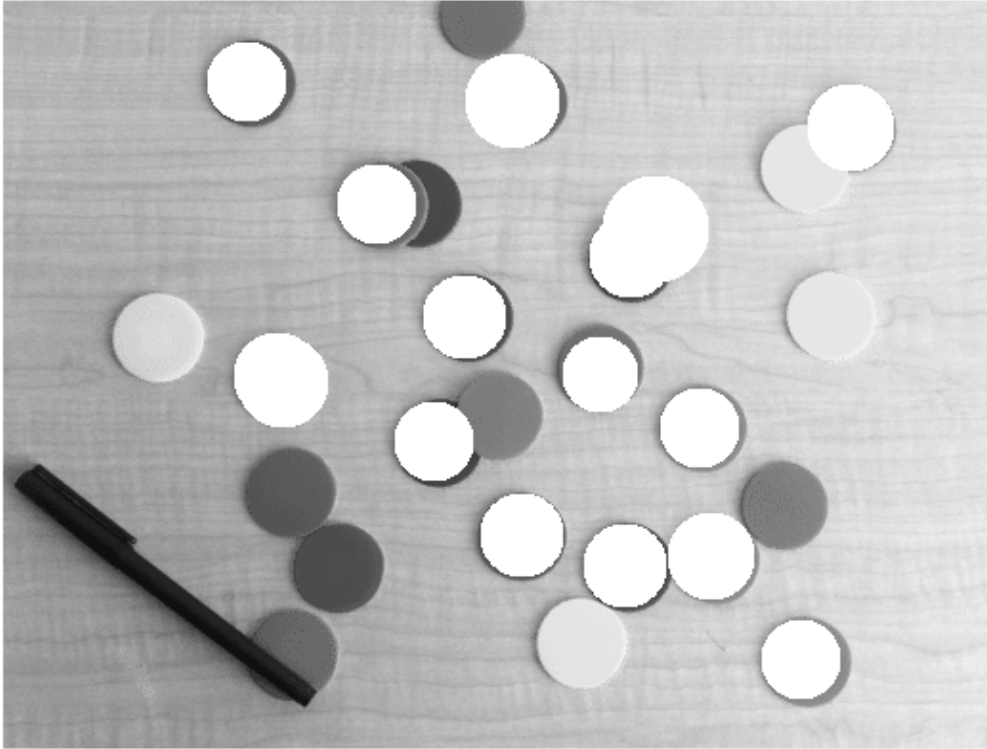```
Int64[22, 23, 20, 20, 24, 28]
```
- `radii`

```
CartesianIndex{2}[CartesianIndex(309, 361), CartesianIndex(320, 460), CartesianIndex(
```
- `centers`

```
6
```
- `length(radii)`

```
• begin
• 	img_gray;
• 	for i in 1:length(radii)
• 		img_gray= draw!(img_gray, Ellipse(CirclePointRadius(centers[i],radii[i])))
• 	end
• 	img_gray
• end
```

0

```
• begin
• 	#method to save a image with a particular directory in a specific format froma a
  loaded image
• 	save("assets/resuult-roundchips.png",img_edges)
• end
```