```
clc; clear all; close all;

Rotor = [];
AirGapRatios = [];
for k = [2 3 5 6 7 9 10]

    img1 = imread(['impellers/rotor',sprintf('%2.2d',k),'.jpg']);

    Ihsv = rgb2hsv(img1);
    I = Ihsv(:,:,3);

    BW = edge(I,'Canny',0.3);

    SE1 = strel('line',4,0);
    SE2 = strel('line',4,90);
    BW = imdilate(BW,[SE1 SE2]);

    BWfill = imfill(BW,'holes');

    [labels,number] = bwlabel(BW,8);
    Istats =regionprops(labels,'basic','Centroid');
    [maxVal, maxIndex] = max([Istats.Area]);
    Istats(maxIndex).BoundingBox;

    x = Istats(maxIndex).BoundingBox(1);
    y = Istats(maxIndex).BoundingBox(2);
    w = Istats(maxIndex).BoundingBox(3);
    h = Istats(maxIndex).BoundingBox(4);

    CentX = x+w/2;
    CentY = y+h/2;

    X = 0:(sqrt(numel(BWfill))-1);

    r = max(w,h)/2;
    cir = bsxfun(@(CentX,CentY) CentX.^2+CentY.^2<r^2,X-CentX,X'-CentY);
    sumInt = sum(cir);
    totalPix = sum(sumInt);

    airImg = cir - BWfill;
    sumInt = sum(airImg);
    gapPix = sum(sumInt);

    gapRat = gapPix/totalPix;

    Rotor = [Rotor; k];
    AirGapRatios = [AirGapRatios; gapRat];

end
tab = table(Rotor,AirGapRatios);
disp(tab)
```

```
    Rotor    AirGapRatios
    _____    ____________

     2       0.34505
     3       0.15384
     5       0.27258
```

```
     6       0.33364
     7       0.17244
     9       0.14191
    10       0.16017
```

Published with MATLAB® R2016b