

---

## Table of Contents

.....	1
Jukowski Airfoil parameters .....	1
Mesh parameters .....	1
Generate mesh for Jukowski Airfoil .....	1
confroaml mapping .....	1
plot Mesh in Z plane .....	2
Plot mesh in W plane .....	2
Output Mesh to tecplot file .....	3

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%% Program name: JoukowskiOMesh.m
%%% Program Prupose: Generate Joukowski Airfoil O mesh
%%% Aurthor : Yang Yang
%%% Date : 2015.09.21
%%% Version: 1.0
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

## Jukowski Airfoil parameters

```
c = 0.5;
lambda = 0.1;
```

## Mesh parameters

```
N_r = 100;
N_theta = 200;
r_span = [(1+lambda)*c,5];
theta_span = [0,2*pi];
```

## Generate mesh for Jukowski Airfoil

```
r = meshfun(r_span,N_r);
theta = linspace(theta_span(1),theta_span(2),N_theta);
[R,THETA] = meshgrid(r,theta);
x = R.*cos(THETA) -lambda*c;
y = R.*sin(THETA) ;
W = x + sqrt(-1)*y;
```

## confroaml mapping

```
Z = 0.5*(W + c^2*(W.^(-1))) );
X = real(Z);
Y = imag(Z);
```

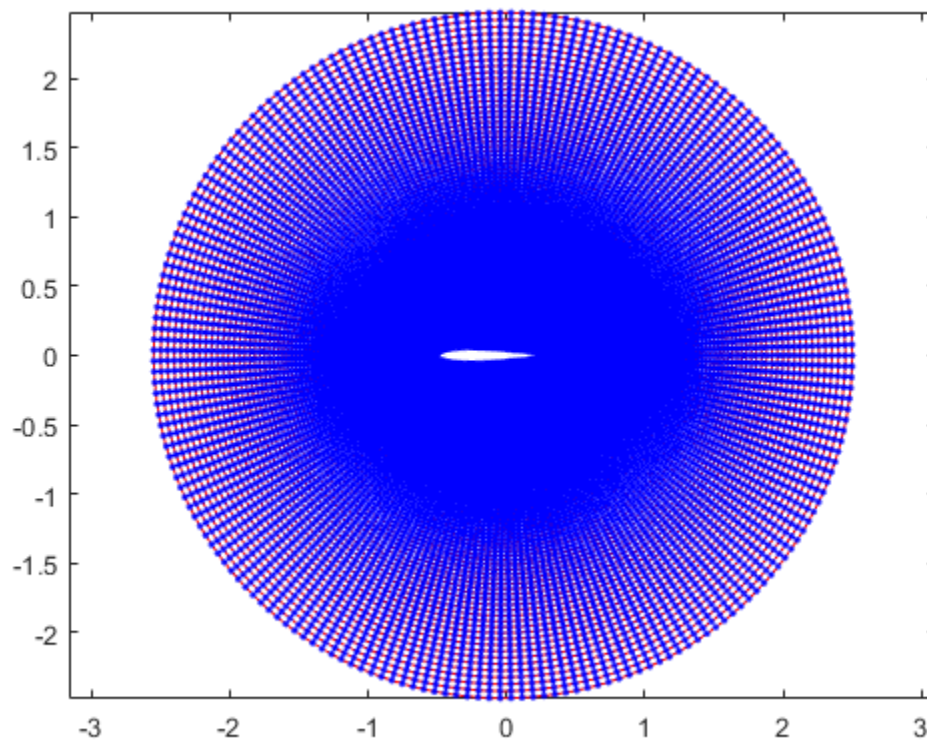
---

## plot Mesh in Z plane

```
[imax jmax] = size(X);
figure('Color',[1 1 1]);
% plot phi
for j = 1:jmax
    for i = 1:imax-1
        plot([X(i,j),X(i+1,j)], [Y(i,j),Y(i+1,j)], 'r.-')
        hold on;
    end
end

% plot varphi
for i = 1:imax
    for j = 1:jmax - 1
        plot([X(i,j),X(i,j+1)], [Y(i,j),Y(i,j+1)], 'b.-')
    end
end

axis equal
```



## Plot mesh in W plane

```
figure('Color',[1 1 1]);
% plot r
```

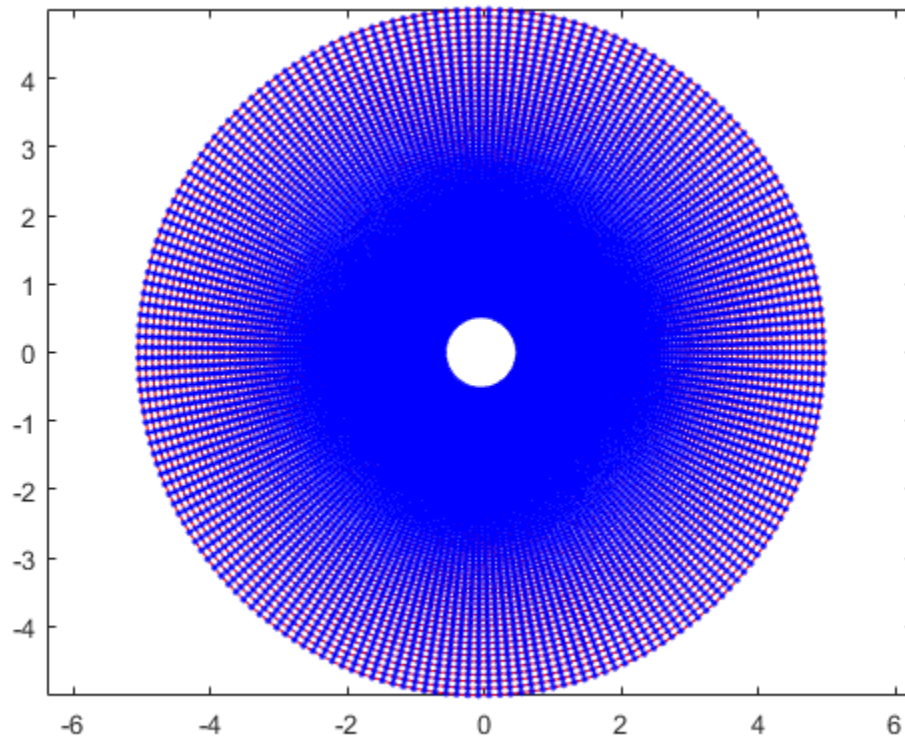
---

```

for j = 1:jmax
    for i = 1:imax-1
        plot([x(i,j),x(i+1,j)],[y(i,j),y(i+1,j)],'r.-')
        hold on;
    end
end

% plot theta
for i = 1:imax
    for j = 1:jmax - 1
        plot([x(i,j),x(i,j+1)],[y(i,j),y(i,j+1)],'b.-')
    end
end
axis equal

```



## Output Mesh to tecplot file

```

fp = fopen('JoukowskiMesh.dat','w');
fprintf(fp,'Title = JoukowskiMesh\n');
fprintf(fp,'VARIABLES = "X", "Y"\n');
fprintf(fp,'ZONE I =%d, J =%d, F = point\n',imax,jmax);

for j = 1:jmax
    for i = 1:imax
        fprintf(fp,'%e, %e\n',X(i,j),Y(i,j));
    end
end

```

---

```
end  
fclose(fp);
```

*Published with MATLAB® R2015b*