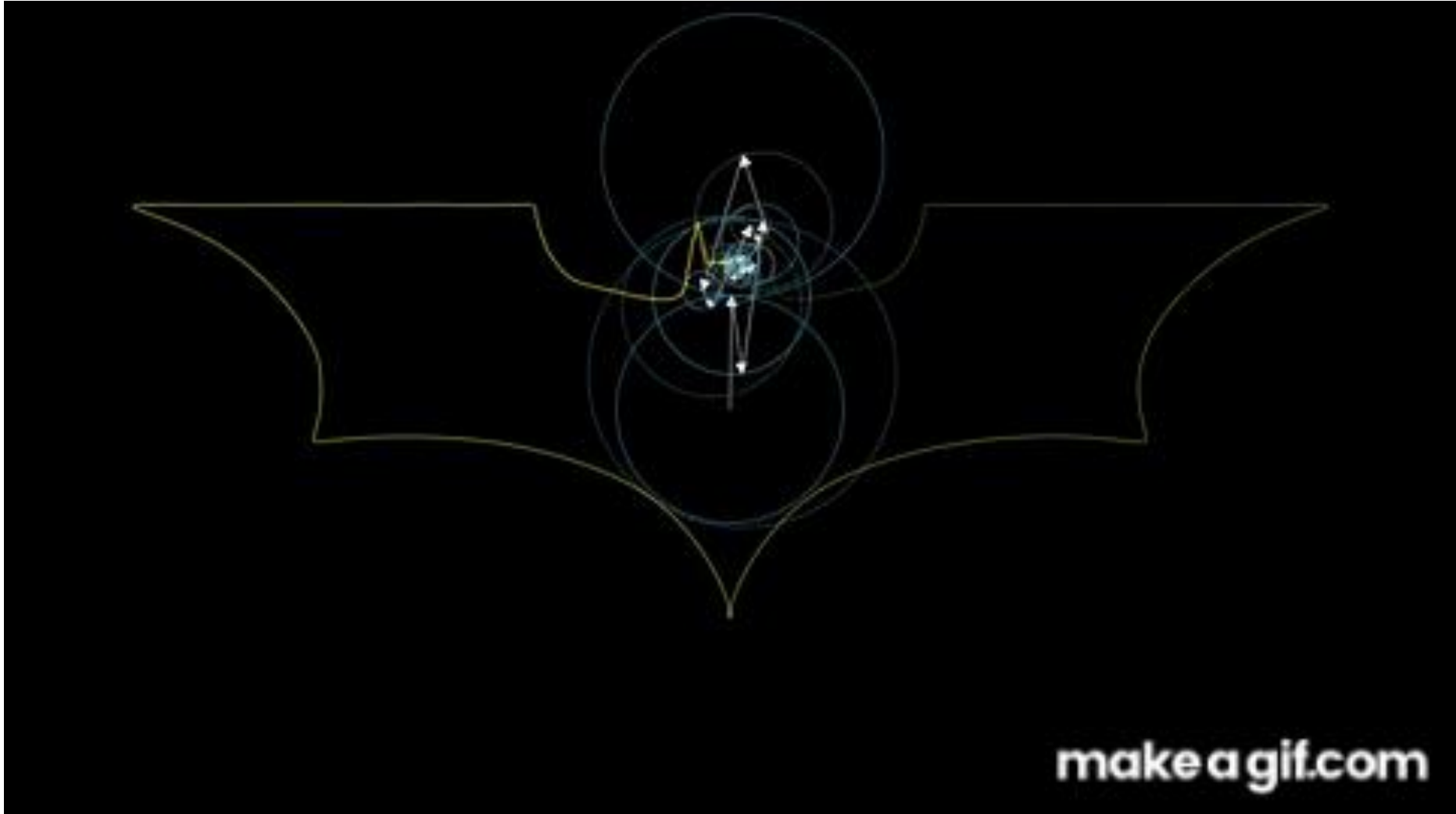# Fourier Transform 2D-Drawing

Kim Danbi

Fourier Transform can draw any 2D image

How to do

- Mathematical background for Fourier Transform

$$c_n = \int_0^1 e^{-2\pi i n t} f(t) dt$$

- Using the Numerical Integration to find initial point and radius

- Using MATLAB animation

Input : a simple black and white image

Output: an animation that drawing the given image

How to do

Step1) Get the path of an image

We can read the pixel value of an image by MATLAB

i) Make the set of whole black points in the image ⟵ Here!
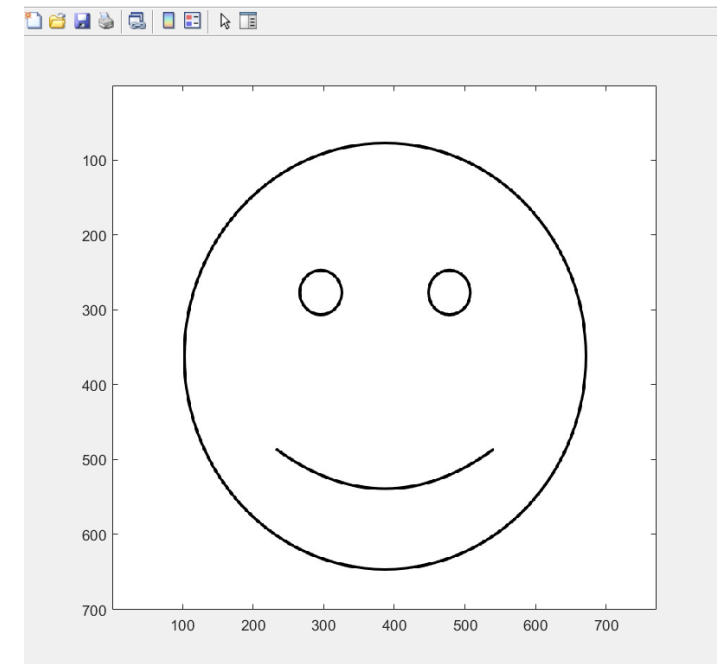
ii) Choose any arbitrary initial point

iii) Find the most closest points

Step2) Find the Fourier series

Use numerical method

Step3) Draw the animation

```matlab
A = imread('image.jpg');
size_A = size(A);     % 700 pixels * 771 pixels * RGB
row = size_A(1);
col = size_A(2);

R = A(:, :, 1);
G = A(:, :, 2);
B = A(:, :, 3);

image(A)

Black_Point = [];

for i=1:row
    for j=1:col
        if(R(i, j) < 10 && G(i, j) < 10 && B(i, j) < 10)
            Black_Point = [Black_Point; [i, j]];
        end
    end
end

Black_Point
```