Digital Image Processing

ECE 4501/6782

Instructions: ***Please submit 1 PDF document with your answers****. Handwritten notes can be scanned with apps such as CamScanner. Typing the answers out is recommended, wherever possible.* ***Include any code if attempted.*** *Assume that you can use MATLAB/Python functions wherever it is not mentioned EXPLICITLY to build your own.*

Learning Objectives

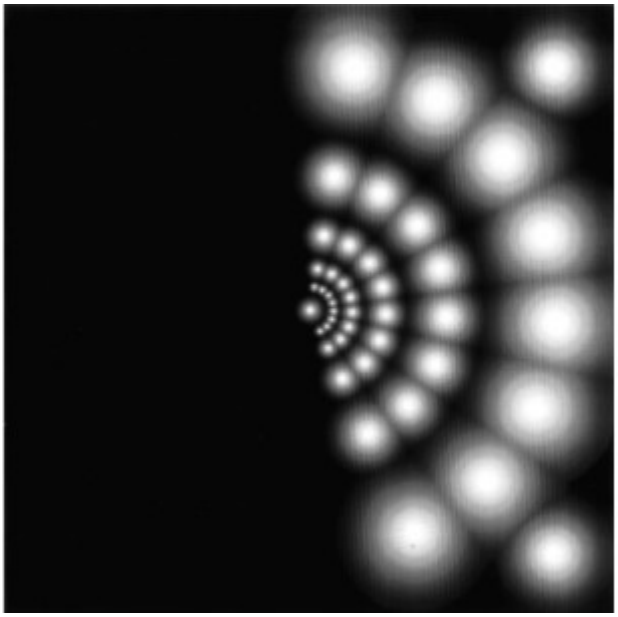
1. *Implementing Gabor Filter Banks.*
2. *Utilizing Gabor Filter Banks for Texture Segmentation.*

Question 1 *25 points*

Implement your own Gabor Filterbank. You're welcome to look at other code (including that of your classmates), but I want you to make your own filterbank.

Question 2 *5 points*

Display DFT magnitude of filterbank (All filters in one DFT).



(it doesn't have to look like this, but this is an example)

Question 3 *5 points*

Apply the filterbank you created to the two images attached in the Question. Display your filtered results.

Question 4 *15 points*

Use the filterbank results (somehow) to classify the textures in the images. The result is a **texture segmentation**. (maybe you display one texture in one intensity/color and the other texture in another intensity/color, etc.).

Images: brodatz4.png, brodatz5.jpeg