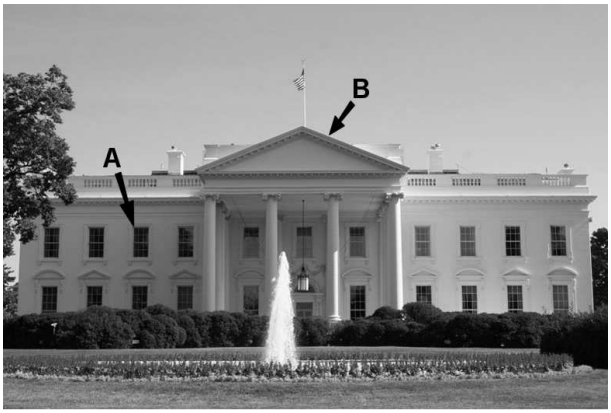
Department of Computer Science
National University of Singapore
CS4243 Computer Vision and Pattern Recognition
AY2012-13 Semester 1

Assignment 2

Deadline: 22 October 2012

Image Mosaicking



As a computer vision expert in VisionTech Inc., you are given the task of mosaicking multiple images into a large image. Three of the images contain the house as shown above with overlapping parts. You recognise that your first task is to implement an algorithm that detects and matches good feature points in the various images. Your algorithm computes the auto-correlation matrix $\mathbf{A}$ at each point of the image I

$$\mathbf{A} = \begin{bmatrix} \sum_W I_x^2 & \sum_W I_x I_y \\ \sum_W I_x I_y & \sum_W I_y^2 \end{bmatrix}, \tag{1}$$

followed by the eigenvalues λ_1 and λ_2 of $\mathbf{A}$.

(a) What is the relationship between λ_1 and λ_2 at the dark window corner labeled A? Is this point a good feature point for image mosaicking? Explain your answers.

(b) What is the relationship between λ_1 and λ_2 at the top edge of the roof labeled B? Is this point a good feature point for image mosaicking? Explain your answers.

(c) Mark in the house image above a good feature point for image mosaicking. Explain why it is a good feature point.