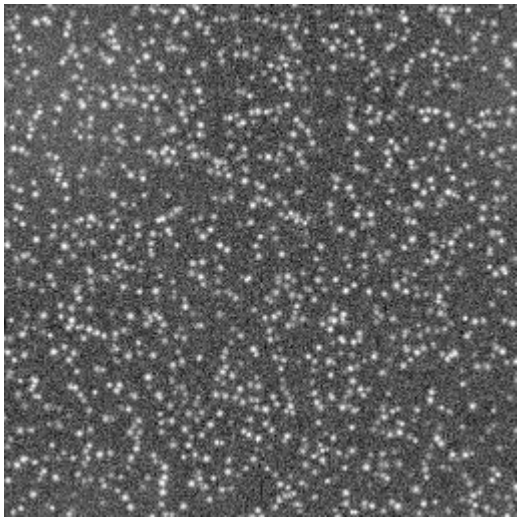
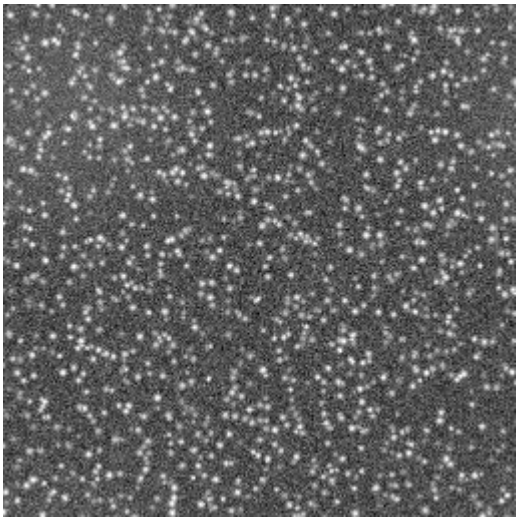
ME244: Homework 3

Released on March 05, 2019

Submission date: March 14, 10:00 am





(Images courtesy. Prof. Steve Wereley, Purdue University)

1. Download the two images shown above from the course website. Calculate with a convenient programming package, the minimum quadratic difference (MQD)

$$D(m,n) = \frac{1}{M \cdot N} \sum_{i=0}^{M-1} \sum_{j=0}^{N-1} [g_1(i,j) - g_2(i+m, j+n)]^2$$

and the correlation

$$\Phi(m,n) = \sum_{i=0}^{M-1} \sum_{j=0}^{N-1} g_1(i,j) \cdot g_2(i+m, j+n)$$

These computations can be performed using a small window of 64X64 pixels located roughly at the center of the images. Identify, the displacement (in pixels) with sub-pixel accuracy. Provide

- Wire mesh plots of MQD and correlation functions
- Displacement in pixels.
- Code used to perform the calculations.