BME 42-731 / ECE 18-795 Reading Assignment #2

Bioimage data analysis I: particle detection

Assigned on Feb-24-2010,
Due on March-15-2010 in class

A. Overview

The goal of this reading assignment is to review particle detection techniques for bioimage data analysis.

B. Instructions

Write a report that briefly reviews methods for particle detection and for achieving sub-pixel detection resolution. Many of these methods have been covered in lectures 8 & 9. Briefly comment on their strengths and limitations.

Any or all of the following references may be used.

(1) Reference articles

[1] M. K. Cheezum, W. F. Walker, and W. H Guilford, Quantitative comparison of algorithms for tracking single fluororescent particles, *Biophysical Journal*, 81:2378-2388, 2001.

[2] A. Ponti, P. Vallotton, W. C. Salmon, C. M. Waterman-Storer, and G. Danuser, Computational analysis of F-actin turnover in cortical actin meshworks using fluorescent speckle microscopy, *Biophysical Journal*, 84:3336-3352, 2003.

[3] D. Thomann, D. R. Rines, P. K. Sorger, and G. Danuser, Automatic fluorescence tag detection in 3D with super-resolution, *J. Microscopy*, 208:49-64, 2002.

Also, feel free to use any additional references you find useful. Be sure to cite properly.

C. Report format

The report, including references, must not be more than 3 pages. Reports longer than 3 pages can not be accepted.

Page size: letter
Line space: single
Page margins: no less than 1 inch
Font size: 12 points for the main text; 10 points for listed references

D. General guidelines

- Divide your report into sections/subsections and use section/subsection titles for clarity and readability.

- Use your own words. Avoid literal replication of texts in references as this could run the risk of plagiarism http://www.studentaffairs.cmu.edu/acad_integ/acad_integ_text.html.

- Be sure to use quotation marks to indicate literal quotes.