Computer Vision
Exercise 4: Stereo and Grouping

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Due date: Tuesday March 19th at noon

1 Programming exercises

This week we will not have any programming exercises

2 Critic reading exercise

This week assignment is a paper for segmentation with watershed transform [1].

3 Problem Sets

Mean-shift Derivations: Please derive the close form updates of the mean-shift algorithm. What is the influence of the parameter h? What's the role? How can we select it? Are we guaranteed to find all the modes? how?

Normalize Cuts: Derive the approximations and solution of the normalize cuts algorithm. When would you use this algorithm? What's the advantage/disadvantage of this algorithm vs the other grouping algorithms seen in class?

Geometry of Planar/Rotational Motions: Derive the equations for the case of a translation only motion. What's the focus of expansion? how can I calculate it? Is this an approximation? What happened in the case of rotation only motions? Be as precise as possible in your derivations

References

[1] P.Arbelaez, M.Maire, C.Fowlkes, and J.Malik. Contour detection and hierarchical image segmentation. In *PAMI*, 2011.