

# Week 2 paper summary

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## Summary

In this paper, Boykov and Funka-Lea [1] present a new method of segmentation framework for image data. They show that their method is fast and practical as well as having a solid mathematical basis. The framework is the first globally optimal object extraction method for N-dimensional images. In addition, their method combines many good characteristics of the older methods such as snakes and active contours. In their algorithm, the segmentation boundary is found by finding the minimum cost cut on the defined graph. For example, inexpensive edges are good choices. They prove that the minimum cost cut gives optimal segmentation for energy and hard constraints. A correction method is proposed which is adding hard constraints where segmentation is not correct. This process can find the new global optimum to satisfy the new constraints. A user can draw additional seeds and the algorithm can recompute the solution in seconds. Although the constraint options are wide, they are still restricted to guide the segmentation process. On the whole, their work introduced many practical photo and video applications and the framework can be generalized to multi-object extraction problems.

## References

- [1] Yuri Boykov and Gareth Funka-Lea. Graph cuts and efficient nd image segmentation. *International journal of computer vision*, 70(2):109–131, 2006.