Image Foreground/Background Segmentation using Max-Flow

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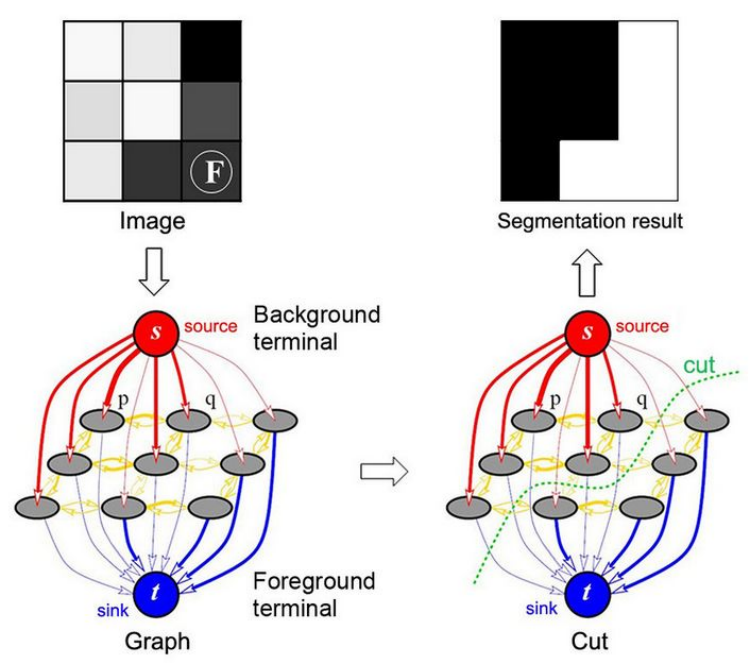
Approach: Max-Flow Min-Cut Theorem

- Take a grayscale image as an input
- Build a network flow graph from the image
- Run a max-flow algorithm to find the min-cut
- Display the image with the min-cut segmentation



Xiao, Pengfeng & Yuan, Min & Zhang, Xueliang & Feng, Xuezhi & Guo, Yanwen. (2017). Cosegmentation for Object-Based Building Change Detection From High-Resolution Remotely Sensed Images. IEEE Transactions on Geoscience and Remote Sensing. PP. 1-17. 10.1109/TGRS.2016.2627638.

Approach: Max-Flow Min-Cut Theorem

Max-Flow Algorithms:

1.Ford-Fulkerson Method (Edmonds-Karp Algorithm: uses Breadth-first search, maybe compare with using depth first search?)

2. Push Relabel Algorithm

Compare with Clustering Algorithms

1. K- Means Clustering

2. Expectation–Maximization (EM) Clustering using Gaussian Mixture Models (GMM)

Project Design

- Language of algorithm implementation: Python
- Max flow algorithm implementation for image segmentation
- GUI

Task Division

Right now, we have looked into two max-flow algorithms, maybe we will find another so each of us can implement one of them.

Work together in the user and graphical interface.