Image Segmentation Using Min-Cut

Problem: automatically classify pixels as foreground or background
Graph Representation

Each pixel is connected to its neighbors in an undirected graph. 

**Goal:** split nodes into two sets A and B based on pixel values, but try to classify neighbors in the same way.
Segmentation by Graph Cuts

Source (set A)

Sink (set B)

Cost to assign to A

Cost to assign to B

Cost to split nodes
Segmentation by Graph Cuts

Source (set A)

Cost to assign to A

Cost to split nodes

Cost to assign to B

Sink (set B)
Graph cuts

Boykov and Jolly (2001)

Min Cut: Global minimal energy in polynomial time

Min Cut

Background (sink)

Foreground (source)

Source: Rother
Demo