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Research Topic
Improving Image Segmentation

Research Problem
Can we do a more efficient method of image segmentation through graphic modeling?

Problem Statement
Given an image construct an algorithm based on graph modeling that will enable efficient image segmentation

Image segmentation is a process in which an image is segmented into pieces that enclose distinct parts of the image.

Problem Description
Image segmentation is an important basic step in computer vision. Image segmentation is also extremely complicated. Dr. Miller improves on existing techniques by leveraging a physics metaphor: spring constants. An image is translated into a graph (pixels are nodes, edges are similarity to neighbors). The weights of the graph are interpreted as springs and the graph is shaken until parts of the graph break off.

Computer Science Perspective
First, computer vision is an extremely interesting topic. Anything that improves image segmentation can ultimately improve computer vision systems. In addition, graph-related algorithms are valuable in computer science because of the sheer number of problems that can be reduced to graphs or networks.

Disciplines actively involved
Pathologist

Description of Disciplines Involved
A biologist is usually involved to provide guidance of the cell parts and expected anatomy to facilitate pattern by which the image segmentation might happen.

References
Presenter web page:
http://www.cs.cmu.edu/~glmiller/
Related paper:
http://www.cs.cmu.edu/~glmiller/Publications/TolliverMiller06.pdf

By: Jamie Olson

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