Peer Review of Sukaynak Husain AlMutawa’s Project Proposal

by Don Johnson

In Sukaynah’s proposal she describes three applications: segmenting and counting cells, identifying facial expressions and tracking the baseball in a video clip of a baseball game.

In the segmentation and counting of cells, she proposes implementing the Chan-Vese active contour without edges algorithm. She mentioned that threshold and gradient-based algorithms would not be effective in segmenting the cells. It would have been interesting for her to state specifically what properties of the Chan-Vese algorithm would give superior results as compared to the threshold and gradient-based algorithms. I assume that she will investigate related topics such as the Mumford-Shah algorithm and active contours while working on her project.

Sukaynah mentioned the problem of cells colliding and the likelihood of a program segmenting the two cells as one. A good solution she mentioned is detecting nuclei because each cell has only one and the presence of two in a blob would indicate that more work needed to be done to separate the blob into two cells.

I really like the second topic she is considering: Identifying some facial expressions. This seems to a difficult and ambitious, but a very interesting topic. He personal collection of family and friends photos sounds like a great data set! I think that she is going to need something more complicated than simple Haar-like filters to identify emotions. I Googled the topic and one paper mentioned using Principal Component Analysis (PCA) to create “Eigen face masks.” These facemasks seem to capture the essential features of a particular emotion expressed on a face and represent a better type of detection filter that Sukaynah should consider.

The last project idea of tracking a baseball in a video clip seems to be, on the surface, the easiest to implement of the three projects mentioned. Where compared to the other two project ideas, this one has the most realistic and detailed description of an approach that might work. My only skepticism involves the resolution of the video and how many pixels will be involved in representing a baseball. A baseball is a very small part of any baseball video and the small number of pixels in the ball object may present some difficulty when trying to track it.

Of the three projects, I think identifying facial expressions would be the most interesting and rewarding. I wish her luck in whichever project she chooses.