

Dear Faculty, IGERT Fellows, IGERT Associates and Students,

You are cordially invited to attend a Seminar presented by Asongu Tambo. Please plan to attend.

Asongu Tambo

IGERT Fellow

Date: Friday, November 4th, 2015

Location: Chung 218 (VISLAB)

Time: 11:00am

Dynamic bi-modal fusion of images for the segmentation of pollen tubes in video

Abstract:

In plant sexual reproduction, pollen tubes are responsible for the delivery of male reproductive material to the ovary. Pollen tubes are single cell organisms that grow through polar extension rather than uniform expansion. Biologists study pollen tube growth to understand how internal cell dynamics affect observable structural characteristics like cell diameter, length, and growth rate. Fluorescence microscopy is used to study the dynamics of internal proteins and ions, but this often produces images with missing parts of the pollen tube. Brightfield microscopy provides a low-cost way of obtaining structural information about the pollen tube, but the images are crowded with false edges. We propose a dynamic segmentation fusion scheme that uses both Brightfield and Fluorescence images of growing pollen tubes to get a unified segmentation. Knowledge of the image formation process is used to create an initial estimate of the location of the cell boundary. Fusing this estimate with an edge indicator function amplifies desired edges and attenuates undesired edges. The cell boundary is obtained using Level Set evolution on the fused edge indicator function. Experimental testing shows that this fusion produces significantly better results than those obtained without it.

