

CLAIMS

What is claimed is:

1. A method for dynamic contrast enhanced (DCE) image processing and kinetic modeling of an organ's region-of-interest to identify a tumor in the organ, the method comprising:

receiving, on an image of the organ and from a user, a seed point of interest that indicates a single point on the organ without requiring an indication of a region-of-interest;

deriving, from the seed-point-of interest, at least a contour of an exterior of the organ's region-of-interest from one or more of a plurality of images;

generating a spline function in response to the derived contour of the exterior of the organ's region-of-interest from the one or more of the plurality of images;

segmenting the organ's region-of-interest in accordance with the spline function;

registering the plurality of images wherein the organ's region-of-interest has been segmented;

deriving a tracer curve for the organ's region-of-interest in the registered images, the tracer curve indicating a change in concentration of a contrast agent flowing through the organ's region-of-interest over a time period; and

kinetic modeling by fitting a kinetic model to the tracer curve to generate one or more maps of tissue that show physiological parameters used to identify the tumor.

2. The method according to claim 1, wherein segmenting the organ's region-of-interest comprises generating segments for each of the plurality of images which include the organ's region-of-interest.

3. The method according to claim 2, wherein segmenting each of the plurality of images comprises:

identifying a plurality of voxels of the organ's region-of-interest in each of the plurality of images; and

dividing the organ's region-of-interest in each image into segments in response to the identified plurality of voxels.

4. The method according to claim 3, wherein generating the spline function comprises encoding information on the derived contour of the exterior of the organ's region-of-interest for facilitating the segmentation of a successive image.

5. The method according to claim 1, wherein the organ's region-of-interest is a tumor.

6. The method according to claim 5, wherein the tumor is a colorectal tumor.

7. The method according to claim 1, wherein the kinetic model is based on a Tofts model.

8. The method according to claim 1, wherein the kinetic model is based on an adiabatic approximation to tissue homogeneity (AATH) model.

9. The method according to claim 1, wherein the spline function is a B-spline function.