BIOMEDICAL ENGINEERING MINI CONFERENCE

ELE588 Biomedical Engineering I

Tuesday & Thursday, December 4 & 6, 2001

Kelley Hall Room 216
Department of Electrical & Computer Engineering
University of Rhode Island

Session I. Tuesday, December 4, 2001

1. 9:30 - 9:40 Area Measurement. Amy Kobayashi
2. 9:40 – 9:50 X-Ray Image Analysis Software. Joshua Mundy
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4. 10:00 – 10:10 Area Measurement. George Dib
5. 10:10 – 10:20 Keith Peters
6. 10:20 – 10:30 Paul Cabral
7. 10:30 – 10:40 A Statistic Approach to Z-Band Identification. Jiang Wu

Session II. Thursday, December 6, 2001

8. 9:30 - 9:40 Daniel Fischer
9. 9:40 – 9:50 Contour and Area of the Image. HoangThi Le
10. 9:50 – 10:00 Al Afdasta
11. 10:00 – 10:10 Jillyan Morano
12. 10:10 – 10:20 Edge Detection. Sridhar Nori
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14. 10:30 – 10:40 Edge tracer for Medical Images. ThuyDuongLe

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Area Measurement

Amy Kobayashi. Biomedical Engineering, Department of Electrical and Computer Engineering, University of Rhode Island, Kingston, RI 02881

My project involves clicking on a picture with the left mouse button to enclose an area specified by the user. The program will leave the outline on the screen for the user to see and will then calculate the approximate area of the portion of the picture defined by the user.

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X-Ray Image Analysis Software

Joshua Mundy. Biomedical Engineering, Department of Electrical and Computer Engineering, University of Rhode Island, Kingston, RI 02881

My project will consist of image analysis software that will allow you to determine the area and volume of the phalange bones in the hand. The program will allow the user to open an X-Ray image and perform these analyses. After opening the file the user will trace an outline of the area that is to be analyzed using 10 points. After completion of this task the program will output the area, volume, maximum radius and maximum length of the bone.

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Medical Image Segmentation by Edge Detection

Yong Cao. Dept. of Electrical & Computer Engineering, University of Rhode Island, Kingston, RI 02881

Edge detection is a very common and important medical image processing technique in image segmentation. This report presents an image segmentation approach based on a simple edge detection algorithm. It was found that this approach had its limitation mainly due to the use of global thresholding. The different existing thresholding techniques were summarized, and their characteristics were discussed.

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A Statistic Approach to Z-Band Identification

Jiang Wu, Dept. of Electrical & Computer Engineering, University of Rhode Island, Kingston, RI, 02881

In this project, a statistics-based method was developed to identify Z-band objects in electron microscopic images and was implemented with VC++. The project was motivated by the fact that the process of Z-band identification and categorization is usually onerous, while important in the study of muscle. The proposed method takes advantage of the statistic characteristics of Z-band objects to find a proper threshold, with which the object is extracted from the original image, upon an assumption that the pixels of an object should have the similar grayscale. This is a kind of global searching process. The testing result showed it was effective with objects of the Z-band kind.

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Contour and Area of the Image

HoangThi Le. Biomedical Engineering, Department of Electrical and Computer Engineering, University of Rhode Island, Kingston, RI 02881

Edge detection was the fundamental step in the Biomedical image processing, so that, the purpose of this project was designed the contour follower of the image and calculating the area of it, which has been selected by visual basic C++ program With this program, I used the Sobel operator, which perform the 2-D spatial gradient measurement on an image and so emphasizes regions of the high frequency that corresponding to the edges. This method used to define the approximate absolute gradient magnitude at each point in the input of grayscale of the images. I also illustrate that an appropriate measure for a pixel being an edge pixel along a given direction is the integrated gradient along that direction. And I use the point that the minimum and maximum integrated gradient magnitudes are simultaneously high at edge locations to detect edge pixels

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Edge Detection

Sridhar Nori. Department of Electrical and Computer Engineering, University of Rhode Island, Kingston, RI 02881

Edges are places in the image with strong intensity contrast. Since edges often occur at image locations representing object boundaries, edge detection is extensively used in image segmentation when we want to divide the image into areas corresponding to different objects. Representing an image by its edges has the further advantage that the amount of data is reduced significantly while retaining most of the image information. A general problem for edge detection is its sensitivity to noise, the reason being that calculating the derivative in the spatial domain corresponds to accentuating high frequencies and hence magnifying noise. For the project ,edge enhancement has been done by a Sobel operator which detects the strength of an edge by averaging pixels on both axes and assigning it to the center pixel.

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Edge Tracing for Biomedical Images

Chuen-Song Chen. Department of Electrical and Computer Engineering, University of Rhode Island, Kingston, RI 02881

This project uses the edge enhance filter and the vessel tracing algorithm to track the biomedical image edge. After using the edge enhance filter, the biomedical image edge will become a continuous path. This project assumes this path has similar width and similar gray value. Choose a start point of image edge, its second point is obtained by searching the maximum convolution point from given direction. Then we can implement the vessel tracing algorithm according to these two points. However, the tracking algorithm will modify its searching direction based on the value of maximum convolution should be similar as its previous stage. The tracing procedure is done by finish the whole image circle or find out the edge ending.

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Edge Tracer for Medical Images

ThuyDuongLe. Department of biomedical engineering, University of Rhode Island, Kingston, RI 02881

There are many different types of medical images present in today's world. In this project is to help identify items on the image by click a mouse to trace the edge of that item. Single mouse click to connect the points on the edge of the image and double click to the last point when the trace is completed. Program is written in C++ and the CTHemorrhage image