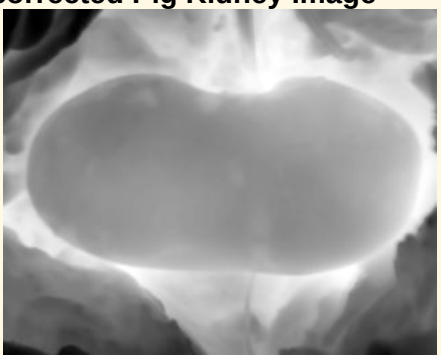
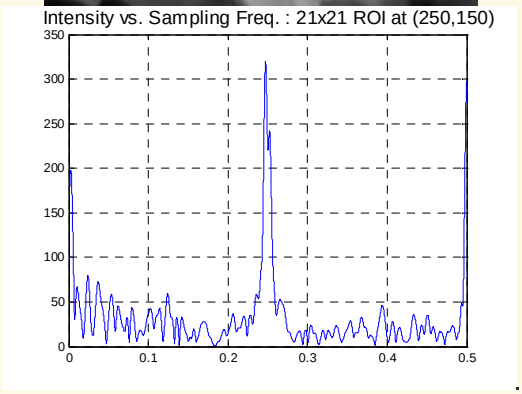
Image Registration for Medical Imaging

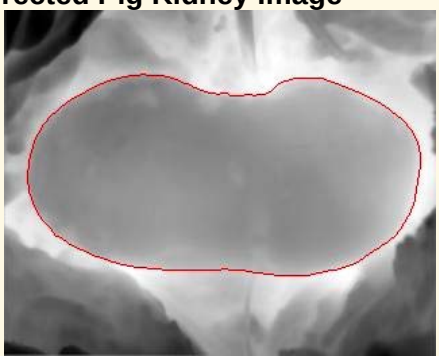
Medical Imaging for Wider Clinical Applications

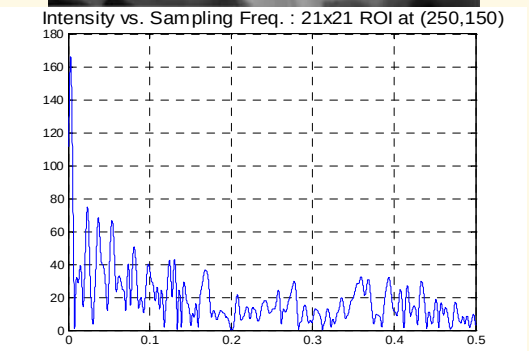
Uncorrected Pig Kidney Image





Corrected Pig Kidney Image





PARTNERSHIPS

OAK RIDGE National Laboratory
Managed by UT-Battelle for the Department of Energy

Summary

Image registration is a visualization tool commonly used in the medical field to assist in a variety of diagnoses and procedures. Images produced via conventional imaging techniques have low contrast features and the borders of the organs are generally difficult to locate as they are not sharp. With image recognition playing an important role in early diagnosis of diseases such as malignant tumors, conventional imaging methods provides difficult to decipher images with ill defined organs and neighboring tissues, often leading to confusion and misdiagnoses.

Scientists at ORNL have developed a system for image registration of only a desired region within each image where the region has a low contrast border with respect to its surroundings. The system locates the targeted area that needs to be imaged; it then segments, registers and extracts features to produce the image. This invention is unique because it only registers the desired region within the image without any surrounding tissues. Therefore, the doctor benefits from sharper and more clearly defined borders, which increases the ease of organ location and diagnoses. This system has been successfully demonstrated on pig kidney image sequences.

Advantages

- Improved contrast of the borders increases the ease of tissue location, identification and medical diagnoses
- Sharper and more clearly defined borders of the images
- Does not require techniques such as template matching or zero-crossing
- Provides image stabilization of tissue in motion during a diagnostic scan or even surgery
- Faster processing of images compared to conventional techniques

Patents

- Image Registration Method for Medical Image Sequences (UTB – ID 1831) , Patent Pending

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