

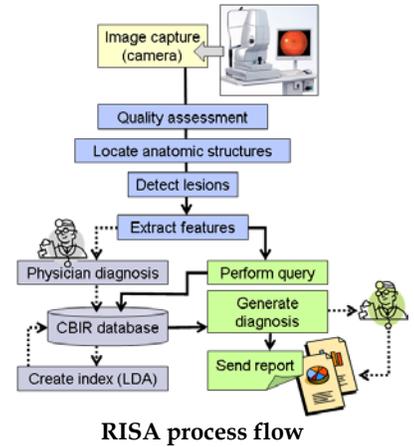
Retina Image Screening and Analysis (RISA)

Rapid Medical Image Screening through Automation

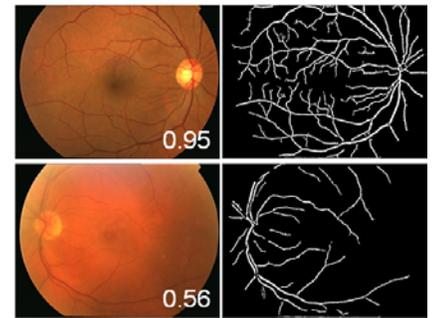
The World Health Organization estimates that 135 million people have diabetes mellitus worldwide and that this number will increase to 300 million by the year 2025. More than 18 million Americans currently have diabetes and the number of adults with the disease is projected to more than double by the year 2050. Diabetic retinopathy (DR) is the leading cause of new blindness in working-age adults in the industrialized world. Thus, there is a significant need to develop inexpensive, broad-based screening programs for DR. ORNL, in partnership with Dr. Edward Chaum, M.D., Ph.D., with University of Tennessee Health Science Center and the Hamilton Eye Institute have been working to develop a system based on content-based image retrieval (CBIR) to automatically characterize retina images.

Base Technology

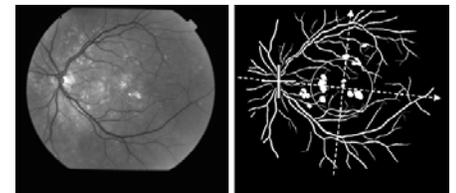
ORNL has developed methods to automatically characterize the quality of a retina image and identify the key physiological features of a retina image. Progress has been made in the detection of retina pathology and characterization of the entire retina from its individual lesions. A telemedicine network which uses the ORNL and UTHSC technology was rolled out in winter 2009 with additional automation to be added over time. A fully automated system is expected by winter 2010.



RISA process flow

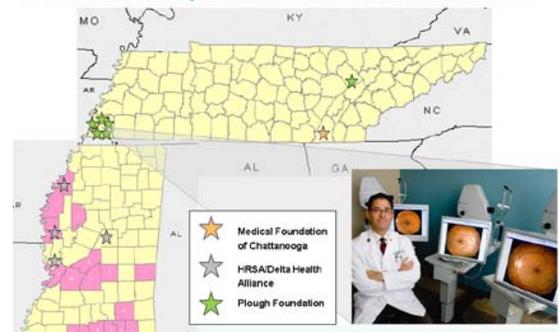


Quality estimation on retina images



RISA physiological characterization of retina

UTHSC/ORNL Ophthalmic Telemedicine Network



UTHSC / ORNL Telemedicine Network

The next generation of

Biomedical Imaging

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