

## Rangaraj M. Rangayyan



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***"It is worth noting  
that the SICI Faculty  
Mobility Program  
grant awarded to me  
resulted in several  
research-related  
activities at many  
locations in India,  
including academic  
and industrial  
research  
organizations."***

Prof Rangayyan collaborative research work with Professor Sudipta Mukhopadhyay at the Indian Institute of Technology Kharagpur (IIT-KGP) was supported by grants from the Shastri Indo-Canadian Institute (SICI). The specific area of their projects was the **development of computer-aided diagnosis (CAD) techniques for the analysis of medical images. They mainly concentrated on: CAD techniques to analyze mammographic images for the detection of breast cancer, and to analyze retinal fundus images for the detection of diabetic retinopathy (DR).**

With financial support from the SICI Faculty Mobility Program, he visited IIT-KGP for the first time as a Visiting Professor in 2010-11. During this visit, he along with Prof. Mukhopadhyay met with Dr. Niranjan Khandelwal, Professor and Head of Radiodiagnosis, PGIMER, Chandigarh. Dr. Khandelwal described and confirmed the need for a CAD system for mammography designed specifically for the Indian clinical context. Ms. Jayasree Chakraborty, PhD scholar at IIT-KGP, was

recruited to work on the joint project and Prof Rangayyan was included as her PhD co supervisor. She visited his laboratory at the University of Calgary in 2011 and on her return she submitted her thesis in February 2013 on CAD of mammographic images. Her thesis proposes novel methods for the detection of mammographic masses and architectural distortion. These are important yet challenging signs of breast cancer visible in mammograms. Novel methods have been developed in Jayasree's work for the detection of pectoral muscles and the nipple. They are two important landmark of breast that appears in the mammograms. She has published three journal papers and five conference papers based on their collaborative work and is now serving the National Institute of Technology, Silchar, Assam, as an Assistant Professor, and continues to collaborate with Prof Rangayyan. During Prof Rangayyan visit to India in 2010-2011, he gave talks on various topics in the general area of biomedical signal and image analysis and CAD. He also had an interview with Arun Dev in Bangalore on medical imaging and CAD, which was published online in the DNA news magazine.

Subsequently Prof Rangayyan and Prof. Mukhopadhyay continued to work on medical imaging and received SICI Collaborative Research Project (CRP) Grant for the project titled "An Indo-Canadian Effort for the Development of Computer-aided Diagnosis Systems for Medical Images" for the period 2011-13. In 2011, they visited Dr. Amod Gupta (Advanced Eye Care Centre, PGIMER, Chandigarh) and discussed the need for CAD of DR. Mr. Ashis Kumar Dhara (PhD scholar under the supervision of Professor Mukhopadhyay at IIT-KGP) was recruited to work at the Uof C lab on multifeature analysis of fundus images for detection of retinal blood vessels and Prof Rangayyan was appointed as a co supervisor of his PhD work.

During the third visit to IIT-KGP for project dissemination in 2012 he delivered seminars on medical imaging at several other universities and institutes in India, including IIT Guwahati, NIT Jalandhar, IIT Roorkee, IISc Bangalore, IIIT Hyderabad, Osmania University Hyderabad, and the PES College of Engineering Mandya. He also conducted two workshops to disseminate research findings and knowledge in the area of CAD and medical image analysis for 30 teachers from numerous AICTE-approved engineering colleges. Professor Mukhopadhyay's and Prof Rangayyan's along with students and colleagues continue to disseminate the results aroused from the SICI-sponsored projects.

For more information on the Project, please contact Prof. Rangaraj M. Rangayyan at  
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