

**Name: Joseph Suresh Paul**

**Introduce yourself in a brief paragraph:**

**My early career research has focussed on applications of signal and image processing techniques for biomedical applications. Following my postdoctoral training at Johns Hopkins, I initiated experimental work for examining the correlation of electrophysiological signals (EEG) and the weak intrinsic signals from Optical images of rodent cortex. I have also set up a Laser speckle imaging set up for estimation and mapping of cortical blood flow in rodents. The limitations of these optical imaging approaches has led me into the exploration of physical mechanisms involved in an imaging process. At the very onset of this latter phase of my research career, I have developed a diffusion model for Acousto-optic interaction. Following this work, I have been involved in developing a mathematical model for image formation in Acousto-optic systems which is under progress.**

**My research is focused on investigation of improved signal processing methods for processing and reconstruction of biological imaging data. The techniques are mainly algorithmic in nature, and involves modeling of the imaging system, generation of synthetic data, application of the relevant signal processing steps and fabrication of the system. My work at UNSW has led to development of novel theoretical background for Acousto-optic imaging of biological objects. Future work would consist of a continual development of the techniques developed at UNSW for application to both microscopic and macroscopic imaging using Acousto-optics. My recent work submitted to Optics Letters is an example of the microscopic imaging application using Acousto-optics. My publication entitled 'Eigen Functions of Acousto-optic modulation' is an example of Acousto-optic imaging of soft tissues. Further ramifications of these, together with one of my recent publications in Journal of optical society of America-A on 'Anisotropic Scattering of discrete array' can lead to a research proposal on Cancer detection.**