"Thinking Machines in the Physical World"
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ABSTRACTS OF SOME LECTURES

*NEUROSURGERY IN 2020 *

LOOKING BEYOND TECHNOLOGY AND SURGICAL EXPERTISE

Prof. K. Ganapathy, M Ch (Neurosurgery) FACS FICS FAMS Ph.D
President, Apollo Telemedicine Networking Foundation
***Past President Neurological Society of India & Telemedicine Society of India ***
http://kganapathy.com/

Unprecedented growth and development in instrumentation, surgical techniques, neuroimaging, and even questioning basic neurosciences is resulting in today's resident being trained to become a master craftsman, a superb technician skilled in knowing more and more about less and less.

There is a very real danger, of tomorrow's neurosurgeon forgetting that there is more than cutting and stitching, that it is not a PET MRI shadow that one should primarily treat or even a tumour – it is the individual and the family with the tumour who is to be managed. People still die *with* a meningioma not *of* one . Looking beyond Technology and Surgical Expertise is equally important*. Change Management* should be the new Mantra. Exposure to participatory not authoritative leadership, acknowledging uncertainty, using support network, focusing on long term results/ goals, ability to empathise and communicate with the patient and the family , a Head who understands strategy, planning & execution and sets realistic goals.

Unlearning and relearning is more important than just learning. Innovating mid course corrections, responding not reacting, delegating and doing the job one hates the most – these are qualities of the ideal neurosurgeon. In the era of evidence based medicine there is still a role for executing actions based on " gut feeling" . A managerial approach to reduce the primary problem into individual constituents is essential. Dealing with very well informed patients is totally different. Familiarity with e-Health, EMR, HIS, mhealth, Smart health, telemedicine, will be as important as familiarity with intra cerebral stenting and coiling. This presentation will emphasise that we should not forget that what we see and hear in conferences is still not always available in the real world. Non intervention, delayed intervention or less aggressive management could still be an option. Primum non nocerum.Neurosurgery is much more than neurosurgery !

"Cortical rhythms in health and disease."

Prof. Kaushik Majumdar
Associate Professor
Systems Science and Informatics Unit
Indian Statistical Institute, Bangalore
http://www.isibang.ac.in/~kaushik/

Our brain works in sequences of electrical-chemical-electrical-chemical-...., which means electrical processes are followed by chemical processes, they in turn are again followed by electrical processes, again followed by chemical processes and so on. Electrical processes bring speed, while chemical ones introduce huge versatility. A back of the envelope calculation will show that it is impossible to have electrical substrates for all chemical processes.

Still, neuronal doctrine holds that everything in the brain can be understood by studying the electrical signals generated by neurons at micro, meso and macro scales. This has remained convenient from experimental point of view as well, because electrical signals are the easiest to study. Although, studying electrical signals alone we get to know even less than the tip of an ice burg in the brain, electrophysiological studies have so far remained the gold standard in the Brain Science research. In this talk we will discuss about how the frequencies of the electrical signals generated from different parts of the cortex are related to healthy physiological functioning of the brain and also in its pathological manifestations.

Transhumanism, Consciousness and Technology

Sangeetha Menon
Professor
National Institute of Advanced Studies, IISc., Campus, Bangalore
http://www.nias.res.in/professor/sangeetha-menon

Susan Blackmore in an article titled 'She won't be me', in the *Journal* *of Consciousness Studies*, presents two of her theses in a fascinating and provoking manner. The first thesis is that many selves exist, the self by itself is fleeting, and no continuous self exists. And, any of the multitudinous selves or parts of them could inhabit a machine, an information system. The second point she makes, without sufficient reasoned analysis, is that the many selves in the future will be happier and contended, and less depressed, because of the technologies used.

There are some significant issues that come up from the above discussion that should worry any researcher in consciousness studies. The existence of selves that are fleeting is not a subject that we can casually discuss limiting them to the futuristic information technology systems. To consider the fleeting self as pieces of information 'copied and stored' in devices is not even a viable postulate for experiments in robotics. The age of the internet and robotics has gone beyond simple information processing tasks and is entering much more complex areas of social media and internet networks that have a viral nature. The self that we should talk about in the context of consciousness has a different role to play in the emerging scenario of people-centred information technologies. By adding a concept of self, which is a 'teme', to the

artificial systems we will not receive any new insights either about the information systems or about the grand idea of the self that is central to consciousness studies.

This presentation will discuss the concept of the self in the context of deeper human expressions, human wellbeing, and the idea on the transference of the self to artificial systems and machines.

India Team:
Prof. L M Patnaik, Honorary Professor, Department of Electronic Systems Engineering,Indian Institute of Science (IISc), Bangalore.
Prof. A K Pujari, Vice Chancellor, Central University of Rajasthan, Rajasthan
Mr. M.G.P.L.Narayana, Vice President, Chief Scientist & Head, Business Systems & Cybernetics Center (BS&CC), Tata Consultancy Services, Hyderabad
Ms. Supriya Kummamuru, Principal Scientist,Business Systems & Cybernetics Center (BS&CC), Tata Consultancy Services, Hyderabad.
Dr. Arundhati Bhattacharyya, Scientist-'G' & Director 'Cybernetics Systems', DRDO, Hyderabad
Prof. Dipti Prasad Mukherjee,Professor & Head,Electronics and Communication Sciences Unit, Computer and Communication Sciences Division, Indian Statistical Institute, Kolkatta.
Mr. V. Udaya Sankar, Deputy Manager, NASSCOM
Prof. T V Gopal, Department of Computer Science & Engineering, CEG Campus, Anna University, Chennai
– 21CW 2016 India Participation Co-Ordinator – gopal@annauniv.edu;gopal.tadepalli@gmail.com; 09840121302