

# Innovations in Sensors Technology for better Health Care

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## ABSTARCT

**Abstract:**Newer and newer sensor technologies are being developed, day by day, for various scientific, engineering and health care applications. Design and development aspects of macro- to nano- sensors are presented here for better healthcare with description of innovations in sensor technology, particularly for old age patients living in isolated areas.

Different types of sensors, viz., piezo-resistive and piezo-electric types and biochip-based sensors are discussed here for novel diagnostic and therapeutic applications. Cancer nanotechnology and therapeutic treatment of deep seated brain tumours, with focussed ultrasound, are given, as case studies here.

Wireless sensor networking (WSN) technology is applied for ubiquitous health care in different environments; anywhere, any time for any one. This would contribute to new direction in biomedical engineering field for better health care.



**Biography :** Prof. (Dr) V.R. Singh, Ph.D. (Electrical Engg), IIT-Delhi and Life Fellow- IEEE and LF-IETE, LF-IE-I, LF-ASI/USI and LF-IFUMB/WFUMB, has over 37years of research-cum-teaching experience in India and abroad (University of Toronto-Canada, KU Leuven- Belgium, Korea University, South Korea, TU-Delft, Netherlands, University of Surrey, UK, and others). He has been at National Physical Laboratory (NPL), New Delhi, as a Director-grade-Scientist/Distinguished Professor and Head, Instrumentation, Sensors and Biomedical Measurements and Standards.

He has over 350 papers, 250 talks, 260 conference papers, 4 books, 14 patents and 30 consultancies to his credit. Under his guidance, 30 PhD scholars have earned PhD degree while others are working with him.

Dr. Singh has been the Associate Editor of IEEE Int Sensor Journal (2010-2016), Associate Editor of IEEE Transactions on Instrumentation and Measurements and Regional Editor of Int Journal of Biomedical Engineering and Technology (IJBET). Apart from this, he is on Editorial/Reviewer Boards of other journals. Like Sensors & Actuators (Switzerland), IEEE Trans on Engineering in Med and Biology, J Computers in Electrical Engineering (USA), J.InstnElectr Telecom Engrs, J.InstnEngrs - India, Ind J Pure &Applied Physics, J.of Instrm Soc Ind, J. Pure &Appl Ultrasonics, J. Life Science Engg, etc.

He is the recipient of awards by INSA (IndNatnlSciAcademy)1974, NPL 1973, Thapar Trust 1983, ICMR (Ind Council of Med Res) 1984; Japan Soc. Ultr in Medicine 1985, Asian Federation of Societies of Ultrasound in Medicine &Biology 1987, IE-I(Institution of Engineers- India) 1988/ 1991,

IEEE-EMBS 1999 and IEEE-2010/2011/2014, for his outstanding contributions. Presently, he has been selected as IEEE-EMBS-DL (Distinguished Lecturer) and INSA-DL.

He has served as Guest Editor of Special Issues of JASI on Physical Acoustics and Ultrasonics (2016-17) and Medical Acoustics (2017-18) as well as on IETE Technical Review journal on Transducers (2002).

He is the Chair of IEEE-EMBS/IMS-Delhi Chapter, President of Acoustical Society of India and Vice President of Ultrasonic Society of India and has been the Vice President of Instrumentation Soc of India, Vice-President of IFSUMB, Secretary of IEEE India Council and the Chairman of IEEE-Delhi Section. Dr. Singh is a Member of IEEE Standards Association. He was also Council Member of WFUMB (Australia) Ultrasound Safety and Standards. He has served as the Chair or a Member of BIS Committee on Elctro-Medical Committee in the past and presently, he is the Chairman of BIS-MHD-15 Committee. He has been the session chair, plenary/keynote/ invited speaker and on advisory boards of world congresses and national/international conferences, world over. He is the Conf Organiser of WESPAC-2018, Nov 10 to 15, New Delhi.

Dr Singh has been Distinguished Professor at NPL-India and Thapar University, and is working as a Director/Advisor of PDM University, Delhi-NCR.

His main areas of interest are biomedical instrumentation, biomedical standards, computer modeling and simulation, sensors and transducers, biomedical ultrasonics/ medical acoustics, POCT devices, neuro-sensors/implants, nano-cancer-technology, cancer hyperthermia, tissue characterisation, lithotripsy, WSN and u-health care engineering.