Dr. TR Hudrlik

CSO at InventionShare

Blaine, MN, US

Dr. TR Hudrlik has been a Biomedical/Biophysics Research Scientist and Inventor for over 35 years.

Biography

Dr. TR Hudrlik studied under Dr. Otto H. Schmitt, the Schmitt Trigger, as a graduate student. He developed techniques to control the electrocautery?s ability to produce action coagulation and fulgeration by dynamically adjusting the effective output impedance under dynamic microprocessor control, an 8085. He was Co-Author of an NIH grant as a graduate student titled Automated Impedance Bioassay Measurement Technique for Cystic Fibrosis. He moved to industry with CPI where he designed the sensing and the rate responsive analog computer and did the clinicals on the RS4 pacemaker the world?s first chronically implanted rate responsive pacemaker. He moved to Dahlberg a large hearing aid company where he endeavored to develop techniques that would alter the hearing curves of response gradually to help recipients train their brain to the prosthetics hearing augmentation. At Medtronic he managed a large team of software and hardware engineers that developed a computer based office practice system that would collect and coordinate real time telemetered pacemaker data and other aspects of the patient data. He moved to the Pacemaker Division as a Research Scientist later to become a Sr. Research Scientist. In Research he developed an in Vitro technique to calibrate and prove the function of an implantable pressure sensor proximal to the leads distal pacing tip. He then developed a new sensing technique that had a signal to noise ratio over 40db better than that of the present sensing techniques used. This technique was able to reliably detect the evoked response from a successful paced beat. This technique was also shown to be capable of tracking the presence and progress of Congestive Heart Failure as well as proving its ability to monitor and track the impact of ion channel impacting cardio-active drugs. He has produced over a dozen patents demonstrating these new sensing and stimulation techniques. He went back to the University of Minnesota at 52 to finish an earlier started PhD program to detail the Electromagnetic Field theoretical basis of the new sensing technique called the Field Density Clamp. The title of the thesis is Sensing with Macro Electrodes. The technique details how to break from the traditional high input impedance sense amplifiers by widening the approach to use variable input impedance including shorting the electrodes and measuring the short circuit current that then flows between the two shorted electrodes.

Areas of Expertise

Electrode Electrolyte Interface, Advanced Mathematics, Biochemistry, Cardiac Pacemakers, Cardiac Sensing, Sensing Techniques, Complementary Current Field Effect Transistor (CiFET), Statistics, Electrical Engineering and Electrochemistry

Affiliations

IEEE Senior member since 1986

Education

University of Minnesota
BSEE Electrical Engineering

University of Minnesota
M.S. Biophysics Biophysics

University of Minnesota
MSEE Electrical Engineering

University of Minnesota
Ph.D. Bioengineering
