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TITLE

Wireless nanonetworks for advanced medical applications and treatments

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The advent of nanoscale wireless sensor networks broadens the realm of applications realized by distributed wireless ad hoc networks. It is anticipated that such newly conceived networks will have a direct impact on disease prevention, diagnosis, control, and treatment, among many other emerging applications. Nevertheless, multi-hop connectivity between nanoscale devices - in light of the short propagation distances stemming from graphene-based submillimeter radiation - poses several challenges insofar as routing, medium access, and electromagnetic transmissions are concerned. Classical microelectronic solutions for distributed ad hoc networking are characterized by algorithmic intricacy and device complexity, leading to increased size and unsustainable levels of power dissipation. We present novel proposals pertaining chiefly, but not exclusively, to early diagnosis and subsequent drug delivery/release using nanosensors with limited complexity. The solutions introduced herein are minimally invasive and are envisaged as mechanisms employable prior to the manifestation of perceptible symptoms.

Biography

Professor Ahmed M. Safwat was born in Egypt. He received his B.Sc. with Honours from Kuwait University. He received his M.Sc. from Queen's University, where he completed his Ph.D. work in two years. He joined the Department of Electrical and Computer Engineering at Queen's University in June 2003. He is the Founding Director of the Laboratory for Advanced Wireless Networks (AWN). Professor Safwat was the Co-Chair of the International Conference on Wireless Networks, Communications, and Mobile Computing (WirelessCom) 2005. He also served as the Publicity Co-Chair for the IEEE International Workshop on Information Assurance in Wireless Sensor Networks (WSNIA) 2005. He was the Co-Chair of IEEE GLOBECOM 2004 Wireless Ad hoc and Sensor Networks. In addition, he was the Chairman of the IEEE IPCCC 2004 Workshop on Energy-Efficient Wireless Communications and Networks (EWCN). He was also the Chairman of the IEEE VTC 2003 Wireless Ad hoc and Sensor Networks Symposium. He also served as the Co-Chair of the Technical Program for the Workshop on Energy-Efficient Wireless Communications and Networks (EWCN) in conjunction with IEEE IPCCC 2003. He serves on the editorial and advisory boards of many international journals and conferences, respectively. Professor Safwat has been tasked to lead cutting-edge projects in the field of wireless networks and nanotechnology. He is the inventor of many landmark technologies, including PA-VBS, Q-GSL, ECPS, E2LA, A-Cell, ACA, ECCA, MTCD, ASRS, ISRS, PIMCM, R-MIMD, X-MIMD, and E-MIMD, among others.