



Wireless Adhoc And Sensor Networks

About the course

Wireless communication technologies are undergoing rapid advancements. The last few years have experienced a steep growth in teaching and research in the areas of wireless ad hoc and sensor networks. These networks have emerged to be attractive in many civilian and military applications and they hold great promises for our future. The attractiveness of ad hoc networks, in general, is attributed to their characteristics/features such as ability for infrastructure-less setup, minimal or no reliance on network planning and the ability of the nodes to self-organize and self-configure without the involvement of a centralized network manager, router, access point, or a switch. These features help to setup a network fast in situations where there is no existing network setup or in times when setting up a fixed infrastructure network is considered infeasible, for example, in times of emergency or during relief operations. Likewise, sensor networks, wherein communication takes place with the help of spatially distributed autonomous sensor nodes equipped to sense specific information, have emerged to be very popular. They find a variety of applications in both the military and the civilian population worldwide such as in cases of enemy intrusion in the battlefield, object tracking, habitat monitoring, patient monitoring, fire detection and so on.

Course layout

Week 1: MANET (Introduction, Self-organizing behaviour, Co-operation)

Week 2: MANET (MAC, Routing)

Week 3: MANET (Multicast routing, Mobility model, Transport layer), Opportunistic Mobile Networks

Week 4: Opportunistic Mobile Networks, UAV networks, Wireless Sensor Networks (Introduction)

Week 5: WSN (Coverage, Topology management), Mobile Sensor Networks

Week 6: WSN (MAC, Congestion control, Routing)

Week 7: WSN (Routing), Underwater WSN

Week 8: Security, Structure of sensor nodes