Wireless Ad Hoc & Sensor Networks

The decentralized control in wireless systems represents a new paradigm of communications. The possibility of managing the network without any prefixed infrastructure lead to new network technologies called Ad Hoc Networks. This wireless systems present different management modalities in comparison with the traditional infrastructured wireless systems. In ad hoc networks is important to manage the routing protocol in a efficient and adaptive way.

The high mobility can lead to a different deployment of routing protocols in comparison to the protocols proposed for wired networks. Also the MAC layer needs to offer some enhanced functionalities in terms of power consumptions and quality of service. For a particular class of networks called sensor networks, the energy saving is a fundamental issue. Our proposed research is focused on efficient routing strategies for ad hoc and sensor networks. We also propose a MAC layer enhancement in order to offer a basic layer on which we base the routing and transport protocols. Cross layering functionalities for an integrated approach between MAC layer and routing layer are also considered. We believe that Sensor integration, coupled with unceasing electronic miniaturization, will make it possible to produce extremely inexpensive sensing devices.

These devices will be able to monitor a wide variety of ambient conditions: temperature, pressure, humidity. We believe, however, that sensor networks requirements are different enough form those of traditional wired and wireless networks to warrant considering a different design. We are investigating particularly the network and the MAC layer and we are evaluating the fundamental challenging of sensor networks: the low energy consumption.