**CHALLENGES:**

• **Changing network topology:** Advanced communication protocols are required to support high level services and real-time operation, adapting rapidly to extreme changes in network conditions.

• **Resource optimization:** Optimized sensor scheduling for distributed networks, through accurate determination of the required density of sensor nodes in order to minimize cost, power and network traffic loads, while ensuring network reliability and adequate sensor resolution for data accuracy.

• **Limitations:** Power, memory, processing power, life-time.

• **Failure prone:** Individual sensors are unreliable, particularly in harsh and unpredictable environments. Addressing sensor reliability can reduce the level of redundancy required for a network to operate with the same level of reliability.

• **Network congestion resulting from dense network deployment:** The quantity of data gathered may exceed the requirements of the network and so evaluation of the data and transmission of only relevant and adequate information needs the be performed. Security is a critical factor in sensor networks, given some of the proposed applications. An effective compromise must be obtained, between the low bandwidth requirements of sensor network applications and security demands.