

Pattern Formation in Wireless Sensor Networks

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Abstract

Biological systems exhibit an amazing array of distributed sensor/actuator systems, and the exploitation of principles and practices found in nature will lead to more effective artificial systems. The retina is an example of a highly tuned sensing organ, and the human skin is comprised of a set of heterogeneous sensor and actuator elements. Moreover, the specific organization and architecture of these systems depends on contextual influences during the developmental stages of the organism. Comparable theoretical and technological methodologies need to be found for wireless sensor networks. We propose the study of reaction-diffusion systems from mathematical biology as a starting point for this endeavor. Algorithms and experiments are described here for a useful set of pattern formation methods in wireless sensor networks.