Clustering Protocol for Wireless Sensor Networks based on Rhesus Macaque (Macaca mulatta) Animal's Social Behavior

Abstract

Clustered sensor networks have shown to increase system throughput, decrease system delay and save energy. In this paper, we propose a bio-inspired clustering protocol inheriting the social behavior of Rhesus Macaque monkeys, targeting prolonged network lifetime. The behavioral features are added to the basic LEACH, thereby reducing the energy overhead involved in the set-up phase. The simulation results prove that implanting these kinds of bio-inspired intelligence into the pre-existing protocols will tremendously increase its performance.

References

- Nor Azlina Ab Aziz, "Swarm Intelligence In Wireless Sensor Networks: For


- Chao Wang, Qiang Lin; Swarm intelligence optimization based routing algorithm for Wireless Sensor Networks; International conference on Neural Networks and Signal Processing, 2008, IEEE.


- Social Structure; http://anthro.palomar.edu/behavior/behave_2.htm

- Rhesus Macaque (Macaca mulatta) - http://www.theprimata.com/macaca_mulatta.html


- Bruneo D., Scarpa M., Bobbio A., Cerotti D., Gribaudo M.; Adaptive swarm intelligence routing algorithms for WSN in a changing environment; sensors, 2010 IEEE.


- S. C Makwana; Field ecology and behavior of the rhesus macaque (Macaca mulatta): I. Group composition, home range, roosting sites, and foraging routes in the Asarori Forest; Journal Primates, Volume 19, Issue 3, pp 483-492, ISSN 0032-8332, Springer.


- M. J. A. Simpson S. Howe; Group and matriline differences in the behavior of rhesus monkey infants; Volume 34, Issue 2, April 1986, Pages 444–459.


- Dario Maestripieri, Christy; Behavior and Social Dynamics of Rhesus Macaques on Cayo Santiago; pp 247-262, genetics and behavior of Rhesus macaques, Developments in Primatology: progress and prospects Springer New York, 2012.
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