

عنوان مقاله:

A Bio-Inspired Model For Emergence of Cooperation Among NanoThings

محل انتشار:

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نویسندگان:

Nasibeh Rady Raz - *Young Researchers and Elite Club Mashhad Branch, Islamic Azad University Mashhad, Iran*

Mohammad Akbarzadeh - *Center of Excellence on Soft Computing and Intelligent Information Processing Ferdowsi University of Mashhad Mashhad, Iran*

خلاصه مقاله:

In the not too distant future, all the objects of various scales can be connected and build a new kind of Internet. This Internet-like structure can put an end to many problems such as early detection of diseases, drug delivery, pollution, extinction of organisms. The Internet of macro/nano things is an infrastructure-less network and communication range limitation is one of its challenges. Intermediate nano-nodes could be used to overcome this problem. However, intermediate nano-nodes may act selfish and refuse to cooperate due to limited resources. To overcome this problem, we propose a bio-inspired distributed model using a trust and a voronoi-based cooperation strategy with teams of neighbors. Using both cell membrane inspiration for making a flexible joining and parting and two metrics of trust and distance, we make a mechanism to promote cooperation in the Internet of macro/nano things. In this architecture, a good reputation encourages each nano-node to cooperate and gain trust of others in a team of neighbors. A nano-node that is located on the shortest path and has high level of trust will be selected to maintain cooperation. In contrast, a nano-node with a low level of trust parts from the team of neighbors and cannot send information. We compare the proposed work with the state-of-the-art incentive cooperation models like DECADE. Results show that the proposed model is completely distributed, adapts to fast changing conditions (dynamic joining/ parting) and achieves good cooperation value.

کلمات کلیدی:

Internet of Things; Emergent of Cooperation; Voronoi Teams of Neighbors; Evolutionary Bio Model

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