Paper Presentation Abstract

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Neural Networks Based Cognitive Wireless Mesh Network

The explosive increase in the number of smart devices hosting sophisticated applications is rapidly affecting the landscape of information communication technology industry Mobile subscriptions, expected to reach 8.9 billion by 2022, and would drastically increase the demand of extra capacity with aggregate throughput anticipated to be enhanced by a factor of 1000.

The number of connected devices and machine-to-machine communications is expected to exceed the number of the population by a factor of 2 over the next three years. As we enter the Internet Of Things (IoT) era in which appliances of common use will become smart digital devices with rigid performance requirements (such as low latency, energy efficiency, etc.), current networks face the vexing problem of how to create sufficient capacity for such applications.

Critical to many of the technology trends related to smart cities is the underlying communications infrastructure that enables smart cities to connect infrastructure, devices, and people, and gather data and deliver services to myriad endpoints. The complexity of smart city technologies and service ecosystems requires a robust network model that offers support for a range of needs, from infrastructure monitoring to backbones for digital media enterprises and from household security to citywide transportation monitoring

On the other hand, wireless mesh networks, a network topology that has been discussed for decades that haven't been put into use in large scale due to its complexity, uneven latency etc

This paper proposes a Neural Networks Based Cognitive Wireless Mesh Network This controlled by a Hopfield neural network envisioned in addressing these challenges thus required to the aforementioned issues giving the network a sensing, learning and reasoning behavior.

The mesh routing method proposed in this paper is based on link state routing protocols. Considering the number of hops, bandwidth, load, and delay we have created a new metric. This metric uses artificial neural network logic in order to optimize route selection, optimize mesh network resources and relax link occupancy. In this way, the probability of network blocking should be minimized. The proposed routing algorithm is based on two different Hopfield neural networks. The first one is dedicated to mobile agent routing logic, in order to ensure that every change of network topology or network parameters is distributed to the network as fast as possible. The other one is dedicated to the routing protocol and the route selection problem based on the previously collected information. All these artificial logics are implemented in the algorithm bearing in mind that Wireless mesh networking attributes (dynamic topologies changes, route stability, and relation between bandwidth and load)

Thus it makes a difference when it comes to the network of the Smart city, smart devices & IoT world today. This paper is a brief introduction of how two simple technologies (WMN & NN) has the possibility to come together in shaping the Future proof networks to potentially make a difference in the new era.