Towards Energy-optimized Collision-free Wireless Networks

by

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All interested are cordially invited.

ABSTRACT:

IEEE 802.11 wireless network standard has become one of the most used wireless networking technologies for smart devices as it offers mobility support and low cost deployment. However, these devices deeply rely on the energy provided by their batteries, which results in limited running time. IEEE 802.11 network standard provides stations with Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) for the medium access. Yet, it results in stations to consume an important amount of power. Therefore, minimizing WiFi-based energy consumption in smart devices has been received substantial attention in both academia and industry.

In this presentation, we will discuss a novel beacon-based energy-efficient collision-free Medium Access Control (MAC) protocol for any type of IEEE 802.11 stations, regardless of being stationary or mobile, or having different amount of traffic flow, transmission rates or traffic types. The protocol is also required to be valid for all types of low or wide bandwidth, single or multi-user Multiple Input Multiple Output (MIMO) WLAN channels, such as IEEE 802.11a\b\g\n\ac. In the presentation, we will demonstrate that energy saving can be achieved enabling stations to transmit on the right time and maintaining stations in the *doze* state during a pre-determined *sleep_time* interval after each successful frame transmission, by making use of modified control and management frames of the standard IEEE 802.11 protocol.

BIOGRAPHY:

Mehmet Fatih Tüysüz holds the B.Sc. degrees from İnönü University, department of Electric and Electronic Engineering and Anatolian University, department of Business Administration. He holds the M.Sc. degree from Dokuz Eylül University, department of Electric and Electronic Engineering. During his M.Sc. thesis, he worked on the Quality of Service Enhancement of VoIP applications over wireless networks and published several papers in this area. He joined Gebze Institute of Technology, department of Computer Engineering in 2008 as a Ph.D. student and graduated his Ph.D in 2013. Currently, he has been working at Harran University, Computer Engineering Department as an assistant professor. His interest includes VoIP, wireless QoS, energy-aware communications and energy optimization in wireless networks. He is also the founder of Nörotek, which was established with the goal of developing character-based spelling devices, utilizing brain computer interface, for paralytics who are not able to speak.