

Procedure and system for the passive location of wireless nodes

A procedure for positioning wireless nodes under a passive approach, i.e., just listening to the radio medium has been developed. Thus, each regular location process run to locate a specific wireless node in the network yields to several nodes knowing their own position. Partners to further develop the system and/or to establish commercial agreements with technical cooperation are sought.

The Challenge

Positioning wireless nodes using time-of-flight measurements is constrained by several factors. One of the most important is the load in the wireless access network: the more traffic in the access network the more delay (i.e. error) in the measurements. Thus, location system has to control the access of the nodes and the provision of services requesting the position of all (of a noticeable number of) nodes in the network to guarantee the location quality of service. Accordingly, scalability becomes a key factor in the deployment of time-based location systems and must be addressed properly.

The Technology

This patented technology allows nodes to be passively positioned in a collaborative network where few wireless nodes (called active nodes) run a 2-way TOA location technique. Active nodes compute the distance to several landmarks measuring the time-of-flight to them. This is done using round-trip-time procedure: sending a packet from the active node to the landmark, which sends back and answer to the active node. During this procedure, passive nodes listen to the radio and, taking specific timestamps are able to compute time-differences related with the position of the landmarks and the active node. Once enough measurements are taken, passive nodes are able to compute first the position of the active node and then their own position, all this without injecting more traffic in the network and improving thus the scalability of the location system.

Innovative advantages

- Joint positioning of active and passive nodes
- Improving the scalability: wireless nodes can be positioned under a passive approach (no traffic is generated for location purposes)
- Improving the integrity: passive positioning can be run in dark areas (i.e. where active positioning is not possible)
- Intensive location traffic services can be provided (e.g. the position of all the nodes in the network)
- Smarter network operation and management tasks can be provided

Current stage of development

The procedure and system have been completely defined and formulated. The system has been extensively simulated and confirms the performance expectances. Implementation in a IEEE 802.11 network is planned.

Applications and Target Market

This technology can be applied in any current or future location system addressed to medium to large networks or constrained environments (e.g. location systems deployed indoors).

Reference number

MKT2011/0027_I

Improving the scalability of the time-based location systems in collaborative networks



Joint positioning of two nodes, which allows accuracy improvement approaches to be used

Reduction of the dark areas in the location system

Business Opportunity
Technology available for licensing with technical cooperation

Patent Status
Two patents applied

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