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Load-balanced routing in industrial wireless sensor network

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Wireless sensor network in industrial environment (denoted IWSN) has data delivery timing constraint. Due to the dynamic routing and transmission collision, the data delivery time is unpredictable. In this paper, a proactive routing which constructs the sensor nodes into a logical circular chain (i.e., ring topology) with token-based transmission is developed to avoid data collision and to provide bounded transmission delay. A traveling salesman problem (TSP) with heuristic algorithm and linear programming modeling with simulated anneal algorithm are applied to construct a load-balanced logical circular chain in IWSN. A Ping-Pong token-pass scheme is applied to prolong the network lifetime. The simulation results reveal that the linear programming with Ping-Pong token-pass scheme has the best performance in load balance and network lifetime.

Biography

Ching-Lung Chang received BS degree in Electronic Technology from the National Taiwan Institute of Technology in 1990, MS and PhD degrees from National Chung Cheng University, Taiwan, in 1993 and 1998, respectively, all in Electrical Engineering. He was an Assistant Professor at the Department of Information & Communication Engineering, Chaoyang University of Technology in August 1998. Since August 2000, he joined the Department of Electronics and Information Engineering of National Yunlin University of Science & Technology. Since August 2012 he has been working as a Professor. His current research interests include computer network, video streaming, and embedded network system.

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