Abstract

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A power-distance based handover triggering algorithm for LTE-R using WINNERII-D2a channel model

Railway systems cannot be apart from the rapid evolution of wireless communication systems. The Long Term Evolution communication system for Railway (LTE-R) is believed to be the normal evolution for current Global System for Mobile Communications Railways (GSM-R). One of the essential targets of LTE is to provide seamless and fast handover from one cell to another to achieve a strict delay requirement while, at the same time, keeping network management as simple as possible. Hence, the decision to trigger a handover is very important in the design of handover process. For handover to be successful, it requires to choose handover parameters correctly and optimize their setting. The LTE-R system uses two parameters to decide handover triggering: Hysteresis and Time-to-Trigger (TTT). The handover triggering is highly depended on the train speed, which means that as the train speed changed, the handover triggering time is correspondingly varied. To determine a more accurate handover triggering point is a critical issue. Too late handover triggering caused by train speed change will lead to handover failure. In this paper, we propose a new handover triggering algorithm called Power-Distance Algorithm that assets to avoid this problem. It eliminates the dependency on the train speed, also, reduces the system processing power. This Algorithm depends on the distance between the two base stations and power received from them. At a certain (predefined) point, the handover triggering must occur. This triggering point is the same for all values of train speed i.e., it doesn't change as the train speed changes. The change occurs only when the Hysteresis value changes.