

## Traveling distance estimation to mitigate unnecessary handoff in mobile wireless networks

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### ABSTRACT

Amidst the factors that degrade the performance of a mobile wireless network (MWN), unnecessary handoff is considered to be one of the premier culprits since it aimlessly consumes the network resources. Most of the existing handoff algorithms proposed for MWN suffer from frequent unnecessary handoff as the primary decision of switching network cells is solely based on a single contributing factor, namely the received signal strength (RSS) that approximates the distance between a mobile node and access points. In practice, the RSS may not provide accurate approximation of the true distance as it fluctuates with wireless propagation impairments (such as shadowing, scattering, and reflection), leading to potential incorrect handoff decision within neighboring cells. In this paper, an improved estimation model for instantaneous distance between the mobile node and access point is formulated. Building upon this model, a new handoff technique is proposed by introducing two RSS thresholds and estimated distance verification, anticipating RSS fluctuations that may lead to handoff decision errors. The performance of the proposed handoff mechanism is thoroughly examined using numerical simulations and the acquired results demonstrate promising advantages of this proposed technique.

### KEYWORDS

Handoff; Mobile wireless network; Received signal strength; RSS; Traveling distance estimation; Unnecessary handoff

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