MS Location Estimation with Genetic Algorithm

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Abstract

Intelligent transportation system (ITS) makes use of vehicle position to decrease the heavy traffic and improve service reliability of public transportation system. Many existing systems, such as global positioning system (GPS) and cellular communication systems, can be used to estimate vehicle location. The objective of wireless location is to determine the mobile station (MS) location in a wireless cellular communications system. The non-line-of-sight (NLOS) problem is the most crucial factor with large measured error. In this paper, we present a novel positioning algorithm based on genetic algorithm (GA) to locate MS when three BSs are available. Recently, GA algorithms are widely used for various optimization problems. The proposed algorithm utilizes the intersections of three TOA circles based on GA to estimate the MS location. The simulation results show that the proposed algorithms can improve the location accuracy, even under severe NLOS conditions.

Keyword：time of arrival (TOA), non-line-of-sight (NLOS), genetic algorithm (GA)