

ABSTRACTS

Wireless mobile phones are used a great deal for emergency phones. However, most cellular networks provide only the most basic emergency phone service. In response to this, the Federal Communications Commission passed a series of regulations in 1996 that require all cellular service providers to provide Enhanced emergency phone service. When the final phase of Enhanced emergency phone service is implemented in 2001, every cellular network will have to be able to determine the position of each mobile in their coverage areas to an accuracy of 125 meters, RMS.

One of the main problems facing accurate location in wireless communication systems is non-line-of-sight (NLOS) propagation. In this Final Project the writer proposed a new location technique that estimates the true, or line-of-sight (LOS), ranges based on NLOS range measurements. The approach utilizes a constrained non-linear optimization approach, when range measurements are available from three base stations (BSs) only. Bounds on the NLOS error and the relationship between the true ranges are extracted from the geometry of the cell layout and the measured range circles to serve as constraints.

Simulation results show that the most significant factor for accurate measurements is the number of NLOS errors in one environment. Besides, for an environment with NLOS conditions, the best is when all of three BSs are NLOS.

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