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A Markov-based Diurnal Mobility Model for 3G Cellular Networks

by

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A Markov-based Diurnal Mobility Model for

not particularly interested in every detail of the movement of a mobile terminal (MT). In the Random Walk Mobility Model [2], an MT moves from the current position to a new position by randomly choosing a direction and speed. The speed and direction are both uniformly

Fig. 2. In direction-based mobility a user will move either one of the two directions from any intermediate cell to reach the destination

Restricting a user movement in direction-based mobility to at most two invariant directions from current cell to its adjacent cells, a Markov model of cell transitions can be formulated. Fig. 3 shows a typical Markov model on direction-based mobility of an user from current cell (0,0) to the destination cell (2,1).

To formulate the transitional probabilities from one cell to its adjacent cells, let us consider C is the centre of the current cell and O is the centre of the destination cell of the MT. Let 1, 2, … 6 be the six directions of possible movements of an MT from any cell.

Proof: The line joining from source cell to destination cell and the line joining destination cell to source cell coincides but opposite in direction. The two closest covering directions of this

is represented by the triplet (MSC-RNC-NodeBs) specifying number of MSCs, number of RNCs and Number of NodeBs in the network. After the creation of the above synthetic cell structure, a specified set of residential locations and office locations (80% residential location

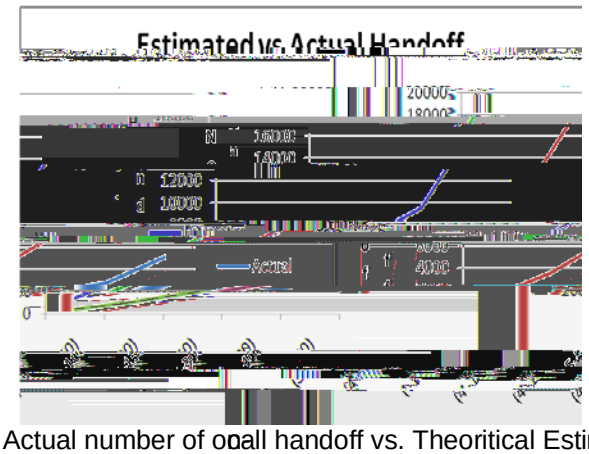

Fig. 6. Actual number of overall handoff vs. Theoritical Estimate.

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