Chapter 7

Conclusions and scope for Future Work

In this thesis, we have critically examined various methods which enable mobile users to roam without interruption to their network communication. Some new techniques have been developed and used to support the communications handoff for increasing the total throughput for traffic management of the system. These results are to be expected because fuzzy algorithms are superior to conventional ones when working in areas of uncertainties. These techniques are better than the existing ones, as our handoff schemes get modified dynamically in accordance with variations of traffic density in the cell.

A new fuzzy based handoff algorithm capable of responding to the fast changes that occur in a microcellular environment is presented. Indeed, a fast handoff response obtained with the fuzzy algorithm is imperative for sustaining continuous communication under microcellular corner condition.

The variable hysteresis value corresponding to the variations of traffic density and mobile velocity optimizes the number of handoffs. The variable hysteresis value produces some sort of intelligence into the system. This helps in reducing dropped calls in high traffic conditions and thus
improves quality of service. The handoff algorithms capable of responding to fast changes that occur in a microcellular environment is presented. The lesser value of hysteresis produced by high velocity mobile or high density of traffic is suitable for handoffs due to corner effect.

Dynamic allocation of guard channels corresponding to the traffic has been proposed. The scarcity of underutilization of radio spectrum is reduced to a high extent, with eventual improvement in the QoS. In other wards some sort of intelligence is observed in the system. A proposal for mobility management is introduced for efficient allocation of flexible channels as demanded by the network. The sudden increase of traffic can be dealt with by providing suitable amount of channels. Depending upon the nature of increase prioritizing of handoff calls over the originating calls is taken due care of. The handoff call remains queued for service from a neighboring cell until either an available channel in the new cell is found or the power by the base station in the current cell drops below the unacceptable level. This prioritization of handoff calls over originating calls reduces the probability of forced termination of handoff calls at the expense of decrease in the ratio of carried to admitted traffic.

The use of codification technique reduces the value of hysteresis with resultant reduction in unnecessary cell dragging. Interference caused by cell dragging and possibility of dropped calls is reduced adequately. The fast handoffs are possible with the codification technique and thus its deployment to microcellular system is highly encouraging.
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Efficient handoff algorithms can enhance system capacity and service quality cost effectively. The proposed handoff detection algorithm is capable of preventing the number of wrong cell handoffs. This is achieved by decreasing the mean number of handoffs. Encouraging results are obtained for handoffs from microcells to macrocells or vice versa by dwell time measurements. Fuzzy logic concept in association with various input parameters has been adopted for handoff management.

To summarize, we have proposed the following technologies to improve handoff:

1. Slope ratio of actual and expected signal selected from current base station.
2. Hysteresis value with variable factor in accordance with traffic density and velocity of mobile reduces dropped calls.
3. Dynamic guard channel and flexible channel assignments enable efficient traffic management.
4. Path codification of mobile station performs proper handoff without unnecessary cell dragging.
5. Dwell time based call overflow between two tiers enhances traffic handling capabilities.
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7.1 Future Work in Handoff

Though the current research work has explored many areas in improving handoff processing; there remain many open areas of research activity in this field. These areas include the analysis of user mobility in different environments by controlling delay of mobile station, particularly when signal fades suddenly due to corner effect. The channel assignment can be achieved by dividing the nature of traffic in various categories like, high load/high mobility; low load/high mobility; high load/low mobility; low load/low mobility. Development of special multicast algorithms especially suited for mobility support can be worked out.
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7.2 References


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