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Wildlife Tracking under Noisy or Unreliable Measurements.

With the miniaturization and advancements of electronic components many scientists who study behavioral patterns of animals opt to use radio-tracking devices. Use of intermittent radio signaling has dramatically improved the lifespan these devices. Intermittent signaling demands robust tracking techniques to accurately approximate the location of tagged animals.

Directional antennas are common in tracking free-ranging animals with tracking devices. These antenna's are constantly moved in order for a better reception while the directional information received by each receiver is subjected to possible noise corruption. With intermittent radio signaling, one can not expect that all receivers are positioned in a location to receive the same signal at the time it is being transmitted.

Many mathematical models that estimate the location of free-ranging animals rely on the reception of transmitted signal by all receivers. The main methodology we utilized in our model is Monte Carlo methods in conjunction behavioral patterns of wildlife in order to improve estimates. The model will continually update its predictions using the available measurements. Simulation experiments are carried out to show the effectiveness of these filters in locating animals with tracking devices. (Received February 27, 2007)