D.J. Anderson dra2zp 08/30/2017

An Analysis of a Large Scale Habitat Monitoring Application

This paper addresses the problem on nodal and network performance focusing on the lifetime, the reliability, and the static and dynamic aspects of single and multi-hop networks. Using nodal networks and wireless telemetry is important because it minimizes observer effects, study site intrusions, and environmental alterations. These sensors make it no longer necessary to visit study areas to monitor and download data. The health and status of these sensors can be monitored remotely and they continuously upload their data to databases, allowing for sensor readings to be monitored in real-time. This paper compares and contrasts single-hop and multi-hop networks and argues that the lifetime of single-hop networks can be accurately predicted while multi-hop networks are vulnerable to traffic overhearing and power source selection. Two key assumptions that this paper makes is that (1) data that is collected from these sensors will still be accurate even if animals change the location of the motes, and (2) the mote itself has no effect on the animal's behavior. This paper accurately describes the system in great detail, offering precise information on power as well as other specifications. Also, the sections "Field Tools Functionality" and "Client Tools Functionality" gives very helpful tips to others on how to install these sensor networks. However, this paper fails to mention the full capabilities of the sensor (e.g. what other things does the sensor measure besides temperature and how are these sensors important). This paper also uses high-level technical jargon that only experts in the field would be able to fully understand (e.g. it doesn't describe what a mote is or what the difference between single- and multi-hop networks is). It fails to mention future implications with regard to how to improve reclamation in the future (since many motes were moved or buried by animals). The most compelling piece of evidence this article offered was Figure 4 and Figure 5 because they compare single- and multi-hop networks and support the claim that lifetimes are much longer in single-hop networks.

Ratings: Presentation – 2, Interest – 3, Impact – 2, Overall – 2, Confidence – 3

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Information Bang for the Energy Buck: Towards Energy- and Mobility-Aware Tracking

This paper addresses the problems associated with GPS tracking. Since continuous location monitoring via GPS tends to rapidly deplete energy, it is important to find alternative methods of tracking that can be used in conjunction with GPS tracking, so that energy can be conserved in the sensor. This paper analyzes an optimization algorithm that attempts to track location most effectively using as little energy as possible (i.e. by relying on accelerometers and magnetometers rather than constantly using GPS). This is important in many areas including autonomous detection of traffic conditions, potholes in a city, and tracking the health of outpatients. Two key assumptions that this paper makes is that (1) the sensors will be used on animals and objects such that the sensor's energy will be able to be replenished often (e.g. outside for sensors with solar panels rather than being underground, for instance), and (2) the data collected when the sensor has a low battery is still mostly accurate. This paper used strong evidence to support their claim that average prediction error was low for the time spent on an activity. This paper also showed that the machine learning used to classify animals' activities were found to be extremely accurate. However, this paper fails to mention how a sensor could be used on animals that rarely see the sun (e.g. bats) since the sensors are meant to replenish their energy through solar power. This paper also doesn't mention how putting these tracking sensors on animals could affect that animal's behavior, especially since the animal probably had to be captured and then released in order to have the tracking sensor placed on it. The article failed to mention the usefulness of tracking animals and classifying their activities. Furthermore, without constant GPS tracking, how were they able to accurately determine their error rate? The most compelling piece of evidence this article gave was Algorithm 1: Mobility Prediction, which tells exactly how they optimized GPS tracking with other tools like accelerometers and magnetometers depending on the battery level of the device.

Ratings: Presentation – 4, Interest – 5, Impact – 4, Overall – 4, Confidence – 5