The Hitchhikers Guide to Successful Residential Sensing Deployments

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1: Summary

The focus of this paper is a general discussion of the main challenges and important goals of a sensor network in the home. The user interaction side of sensor tech is not something we regularly discuss. Most of the discussion is on technical challenges. This paper tells us about the important factors that aren't usually considered in the design of a sensor deployment in the home.

They had a large scale sensor deployment with over 1000 sensors in 20+ homes for a year period. Their experience showed them that the larger the number of sensors, homes, and time, the difficulty scales exponentially at an inflection point.

Failure analysis and reporting is an important part of a rigorously built sensor network. Becuase you can't have constant maintainance of the system so you should be able to detect faults and report the cause properly to allow the users to fix or repair the cause of the break. The classifier they trained reported link loss, battery dead, plug, power outage and various other diagnosis. A good measurement is the sensor-time down.

The next section is the hitchhiker's guide. The problems they discuss cover a wide range of things we usually take for granted.

Powering the sensors is an issue. Most people think we can just use wall sockets but many times that isn't the valid solution. First of all, the outlets are limited and would involve using many wires. Other solution included using inline power or just self powering using solar (like the water temperature difference powering).

Next they talked about connectivity and how a 1-hop system is sometimes not enough. And that you need to account for the "conditions". And make the system one that isn't dependent on maintannce and alot of user interaction

The last thing I enjoyed is that they showed aesthetics matter. As researchers we don't really seem to care about aesthetics. But actual users usually have that as a priority right behind functionality.

2: Strengths

- Coverage of alot of the aspects we take for granted
- Differentiates the myths

3: Weaknesses

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4: Future Directions

- Deploying a sensor network that accounts for all these myths/truths