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## Validation Framework

My thesis will be project based. Therefore the validation of my theses will be through extensive testing of the application I develop. What I am currently looking into is integrating an opportunistic adhoc network into an existing application such as iShake. My thesis idea is still in needs of development, but having an initial idea helps narrows down the possible types of validation tests I can perform. Validation will require creating several hypothesis that are proven or disproven based on empirical evidence. An example of this type of validation can be seen in the applications I explored for my related work assignment--iShake, WreckWatch, and the Electronic Triage Tag System.

The main validation of the iShake application was through testing the iPhone against high quality seismic sensors. The researchers were lucky that they had an "oracle" to test against. They could definitively say if the iPhone sensor was performing the duties asked of it. The iShake system was developed to augment high quality sensors therefore it also needed to be validated in more scenarios . For example, how would the phone react to different resting surfaces, phone covers, and manufacturing variances. All of these variables would possibly affect the acceleration data collected by the iPhone, so the researches performed seismic test with all these different combinations of variables, and eventually made conclusions on the data they gathered.

Testing WreckWatch was not as straight forward as testing for iShake. Traffic accidents can happen thousands of different ways, and accident conditions are not easy simulated unless you actually crash something. Additionally, for WreckWatch to improve the response time of emergency services it was crucial that it did not detect too many false positives. Noting that was a key metric to test researchers spent lots of time proving that WreckWatch would not detect non-accidents. The researchers simulated loud sounds and high g-forces. They also acquired actual accident data and manually validated against this data.

The Electronic Triage Tag system was validated through simulation. Using simulation software they evaluated the ad hoc network they created based on numerous metrics. Three of the most important metrics were number of nodes, number of messages, and time to deliver. Plugging different parameters in to their simulation software they were able to quickly and easily test multiple network scenarios. This system was a proof of concept, and thus they did not do feild testing, yet that would be the next step in signing off on this system.

How many ways can you make your system fail? The main take away from looking at the validation of the above is make sure you are thorough at testing false positives, false negatives, and taking into account all possible variables. Testing is especially important in the case of an application that is suppose to help in an emergency situation. People could be relying on the service you provide.