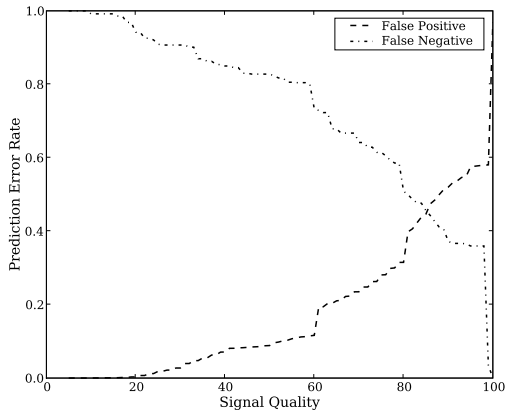

Figure 10: The predictive power of the Windows "Signal Quality" for user irritation, using a threshold-based predictor, as a function of the threshold. There is no threshold which provides simultaneously low false negative and positive rates.

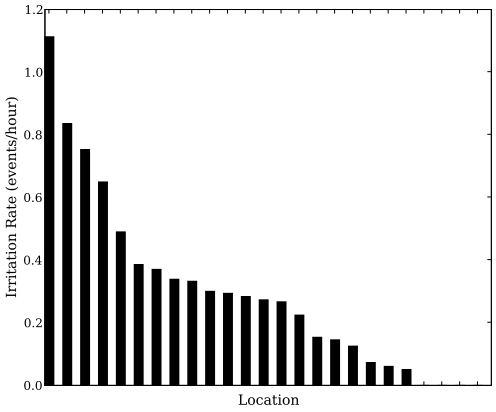

Figure 11: The rate of irritation events for the top-25 most frequently visited access points, sorted in order of decreasing irritation rate.

shows that there is no threshold which provides low false negative and false positive rates simultaneously. Thus, while important, signal quality is not a strong predictor of user irritation by itself. We are *not* claiming that wireless performance is irrelevant to user irritation, but that these metrics are not good predictors of it.

Hypothesis 7: User irritation is affected by user location.
Result: Supported by our evidence.

Finally, we consider the extent to which irritation is associated with wireless access points. Figure 11 shows the rate of irritation for the 25 most frequently visited access points, each having at least 5 hours of user activity. If each access point were equally likely to be associated with user irritation, we would expect a uniform distribution; however, this is not the case. Also, across all access points for which we have more than 1 hour of trace data, the top 20% of locations in terms of irritation rate are responsible for 64% of the overall irritation rate. Improving service at a small subset of locations may result in a disproportionate reduction in total irritation.

5. CONCLUSIONS

We presented a tool and a methodology for collecting and studying end-user irritation with the network "in the wild." We used the data we collected from an extensive user study to test a range of assumptions or rules of thumb that are commonly made in network control systems or adaptive applications. The most important implications of our work so far are that users are able to appropriately assign blame to the network when they are irritated, and that a small number of sources seem to disproportionately contribute to the irritation experienced by those users.

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