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Title: How to measure people's shower length without being a stalker

Abstract: Heating water requires large amounts of energy. While students have little control over much of the energy consumed in dormitories, they do have control over the length of their showers. Thus changing shower length is a potentially high-impact behavior for reducing carbon emissions on college campuses. Further, habits established in college are likely to carry into adulthood, extending the potential impact of an on-campus campaign for shorter showers. Any behavior change campaign should be rigorously assessed for effectiveness. Most college dormitories do not have their hot water pipes metered, and such meters are expensive and inconvenient to install. So how to measure the length of people's showers without lurking about bathrooms with a stopwatch? This talk describes a method we have developed to estimate shower length from data collected from a low-cost HOBO temperature sensor attached to individual shower heads. We have collected ground-truthing data to match the pattern of temperature change to the actual timing of showers. Python code has been developed to extract estimated start and stop times, as well as peak temperature, for individual showers. We describe the results of two CBSM field experiments that evaluated the effectiveness of different signage, using temperature sensor data as the main dependent variable (with supplemental self-report survey data). Baseline data collection began before signs went up, and continued as different versions of signs were placed in different bathrooms. Results suggest that this measurement approach is a viable, noninvasive way to record shower length, and that signs do indeed impact shower length.