Demand response is seen as one way of lowering electricity system costs by lowering system balancing costs, lessening the need for more expensive peaking units; as well as meeting environmental sustainability objectives.

However, demand response programs, in particular programs targeting residential end users, are notoriously unreliable in meeting their load curtailment predictions.For system operators the variance in load shedding performance can make it difficult to incorporate these resources into system balancing and long-term planning. We propose that much of the variance in DR system performance are the result of program design; in particular the focus on the residential electricity consumer as the program partner.Instead of focusing on residential electricity customers, Whisker Labs developed a load shifting product, LoadFlex, targeted at retail electricity providers (REPs) (i.e., the market participant in deregulated markets that sells to the end-use customer). REPs are a more natural partner for a DR program because their objectives are better aligned with the objectives of demand response events (i.e., REPs are subject to price risk given that they often supply electricity at a fixed rate and purchase at variable rates). One important question for a program like LoadFlex is how the residential end-use customer will respond to changes in the comfort of their home given changes we make to their thermostat setpoint.
Between July 2017 and October 2017, Whisker Labs in partnership with Crius Energy, implemented a study across ERCOT to determine residential customer response to the timing, duration, frequency, and setback of demand response events, while controlling for other factors.The study involved 1,500 devices and culminated with several hundred thousand individual LoadFlex events.
In this presentation, we will discuss the results of the study.