While the technologies that enable home automation and smart homes have been around for decades, they have been expensive and complex. As a result, smart homes have mostly been embraced by a small community of affluent and technically proficient early adopters. In the last three years, however, companies have begun to market “smart devices” to average consumers at much lower price points, creating momentum toward mass-market pervasive computing.

As these devices become more prevalent, there is a growing interest in allowing the end users to program these devices. This programming often has the form of “if trigger, then action” which we term “trigger-action programming”. The web service IFTTT (If This Then That) is a popular instantiation of this programming paradigm that enables users to write trigger-action recipes for their smart household devices like the Phillips Hue. We conducted a set of studies to understand the usability, generality, and need for trigger-action programming and found that it holds a great deal of promise for end-user programming of devices.

In our current work, we are building a home-automation prototype system that works with Microsoft’s HomeOS and will allow us to explore how end-user programming and machine learning can work together to control home devices such as thermostats and lights. We will demonstrate our system using a novel lighting control example.