Gesture and Chill: An automated system to watch your favorite TV Shows

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Abstract

In this effort we present an automated system to control the playback of your favorite TV Shows as well as the physical world around you. A gesture based system is presented for playback and environment control to improve the user's TV watching experience.

Author Keywords

Authors' choice; of terms; separated; by semicolons; include commas, within terms only; required.

ACM Classification Keywords

H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous; See [http://acm.org/about/class/1998/]: for full list of ACM classifiers. This section is required.

Introduction

One the things that bugs the most is having to stand up from the couch, or bed, while watching TV to turn off the lights, or order food. We're currently closer than ever to the fully-automated house, so why hasn't somebody come up with a solution for this problem that plagues all of us?

Here we present a product that aims to solve these lifelong problems. The Gesture and Chill controller is a gesture-based system that enables the user to control the playback of its TV shows automatically, as well as the environment

around him. By turning off unwanted lighting and ordering the user's favorite pizza, we're enabling the user to high level of comfort and automation in his own home. Our work is based on Netflix's "The Switch" [1], a button that has functions similar to our controller, but due to the nature of buttons, is less expressive and versatile than a gesture detecting surface.

Description
Our system will consist of two parts, the main controller and a smart energy outlet for managing the lighting of the room, each one of these two components will be connected to the internet and will interact among themselves, the user will only need to interact with the main controller.

Our idea of the main controller consists of a wooden artifact that we will create by using the laser cutter. It will be designed to be placed in a table in the living room, preferably close to the couch. It will feature a "basket" to put the NFC tokens of your favorite shows, an interaction surface that will be the input of the system, and a slot to place the show that you wish to watch.

The user will perform gestures on the interaction surface and the system will react accordingly. We are aiming to enable the user to perform gestures with the tokens over a wooden surface, and that we will be able to capture the gestures by using a magnetometer, however, if this proves to be too complicated for this project we will use a smartphone with a capacitive touch screen to emulate this behavior.

The smart energy outlet will consist of a device connected to a power outlet, and that will expose a new power outlet which the lamp will be connected to. An internet-connected photon will control whether the lamp power source will be providing energy or not. We currently don't have information on how to achieve this, we need to do more research about it.

Components
This is an effort that consist in many different parts interacting between them.

APIs
To achieve our ultimate goal of automating the TV watching process, we'll need to combine different existing services.

Plex Media
Plex is a media serving application that organizes video, music and pictures and allows the user access to its hosted files from anywhere with an Internet connection. The spread of this popular service ranges from Smart-TV applications, to Smartphone applications; being the latter the most popular way to ingest said service.

While there's no official API to access this popular service, thanks to the magic of open source and community, some efforts have been surfacing that allows to control the playback of this popular service.

It's safe to mention that, if we're not able to obtain a good mapping through one of the existing APIs, we will emulate this service by playing files locally on our computers.

Pizza Ordering
What's best than enjoying your favorite show while eating your favorite pizza? Since both activities go hand in hand, we will implement one of the existing, non-official, Papa John's (or other pizza place) APIs to order your regular pizza pie the moment you start your show, getting just in time for the second episode of your marathon.

Physical Interactions
Our presented system will allow the user to interact with it exclusively through the physical world. Using the components presented bellow, the user will grab a representing token and make a gesture in a specified surface to start his/her TV marathon.

Photon & Arduino
We intend to use one Photon and one Arduino. The arduino will be responsible of managing the user interactions and gestures and NFC reading, while the Photon will be in charge of lighting control for the room.

NFC Tokens
As used on our previous project, we will use NFC tokens to identify each TV show. However, we aim to make them a bit smaller for better handling while performing playback gestures on our surface.

Magnetometers
To track the movements of said tokens, we intend to use magnetometers embedded in the surface and on our tokens. By doing this, we are able to build a clean and ample surface for the user to "draw" their actions on.

At the moment, we need to read a bit more into the magnetometer subject to figure out if this will work correctly for us. However, in case that it doesn't we are planning to use a smartphone screen to handle these gestures.

Implementation

1. Enclosure design
Design the enclosures for the main controller and the smart energy outlet with a vector editing tool.

2. Gesture detection
Detect the gestures made by the user by using a magnetometer. We will use an alternative capacitive screen if this proves to be too difficult.

3. Photon, Arduino & server development
Development of the applications that will read the gestures, nfc tags, control the lighting and interact with the various APIs.

4. Enclosure tweaking and component arrangement
We learned that this is a major step in our previous project, here we will adjust the size of the enclosures and redesign as needed.

REFERENCES

1. Netflix. 2015. The Switch. http://makeit.netflix.com/. (2015). Accessed: 2015-11-19.