

TELEVISION VIEWER'S CHANNEL COST CALCULATION SYSTEM

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Abstract

Television viewers channel cost calculation system(TVCCCS) monitors users channel viewing time in seconds and then charges the user accordingly. TVCCCS is specifically defined to significantly reduce the monthly television bills by allowing the user to pay exactly for the number of seconds the television service is used. This has been done with the help of an Arduino board, a server along with the set top box of the television broadcasting company. The Arduino acts as an interface between the set-top box and the server. Server is programmed to generate the monthly bill using the viewing time of every channel received from the Arduino micro-controller. The monthly bill amount is then deducted from the main balance of the user at the month end. This will continue till end of main balance. Proposed invention will be beneficial for the common people as it helps to get rid of unnecessary and extra amount of charges.

KeyWords: Networking, Television System, Television Service Provider

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1. INTRODUCTION

The emerging trend in the current television industry is that of Smart Television Systems where the user has the ability to select the channels he wishes to watch and pay for the same only. One of the main properties of the smart television system is portability. The television channels can also be streamed using various online streaming facilities.

In the traditional television systems, we usually subscribe to a particular plan which includes multiple channels. The users usually only view channels of their local language and some specific news channels and some channels of national importance and they have to pay for the rest. Another problem is the time constraint. Even if the users watch a certain channel for say 20 hours per day or just for 10 mins they have to pay the same amount. Even if the user is allowed to select channels in advance, user still has to pay the same cost for each channel as they were applied in the subscription plans.

In our invention we are planning to create a system which will allow the user to select a specific set of channels to choose from. The system will also count the viewers time of watching a specific channel in seconds and the user will be charged accordingly. We will be using a Arduino microcontroller which will be connected to the setup box and its duty will be to transmit the users channel watching time to the server serially via the transmission port of the Arduino Kit. One of the main advantage of this proposed system will be that the user will have the complete control over the channel the user wishes to watch.

The rest of the paper is organized in 4 sections. The 2nd section explains the proposed system briefly along with the block diagrams for the same. In the 3rd section conclusion of the paper is provided and in the 4th section Future scope of the proposed system is given. In the 5th section, a list of papers which have been referred to are listed.

2. PROPOSED SYSTEM

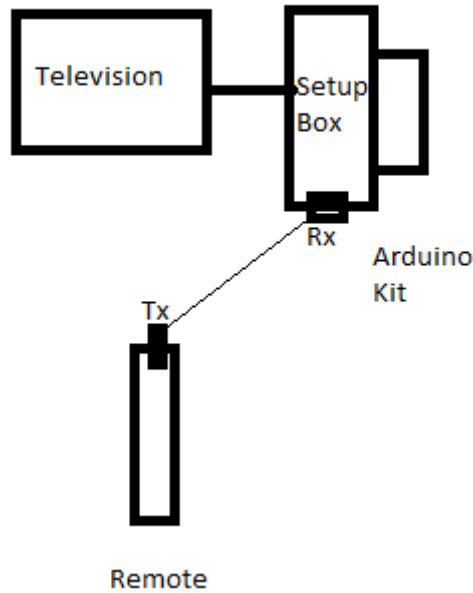
1.1 Detecting Channel Selected by User

The basic blocks of our system are:

- Television System
- TV Remote
- Set-top box with an Arduino kit
- Desktop PC/Laptop

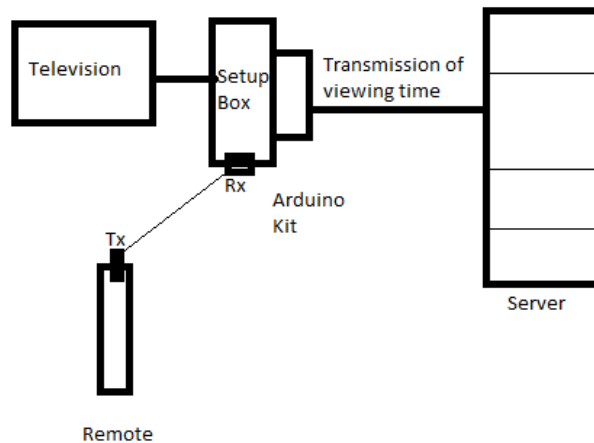
Every button on TV remote generates a signal with a unique frequency which is detected by the receiver of the set-top box which then displays the appropriate channel for that frequency. The Arduino kit has two ports, an Rx port (receiver port) and

a Tx port(transmitter port). In our proposed system when user presses a certain TV remote button, the receiver inside the set-top box first detects it using its receiver port and passes the appropriate channel number to the Rx port of the Arduino. The transmission for the same is done serially which is displayed diagrammatically in the above figure 1.2 where a connection is shown between the television and setup-box and the Arduino Kit and also the connection between the remote and the set-up box and also various connections between them are shown in the figure.



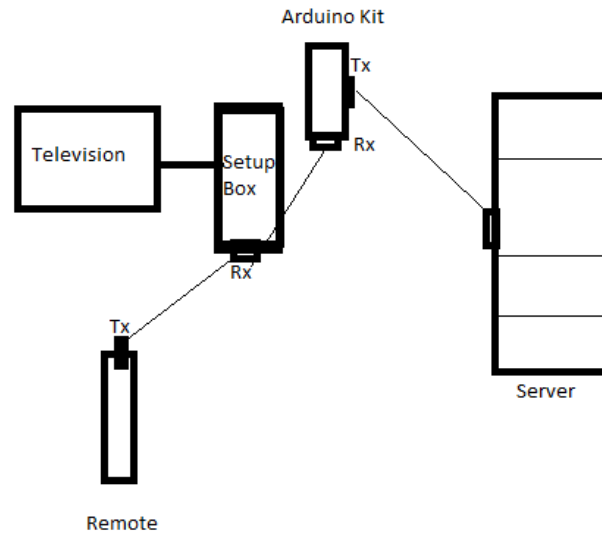
1.2 Transmission of Detected Channel to the Server

The Tx port of the Arduino kit is connected to a server(laptop/PC) via a USB cable. As soon as the Rx port receives the channel number it transmits Channel ON status to the server using the USB connection along with the time for which the channel is having an ON status. When the channel gets changed or when the TV is switched off, the Tx port then transmits a Channel OFF status to the server.



1.3 Calculation of Viewing Time for every Channel

The server will eventually have the records of every channel the user has watched along with the viewing time for the same which the server receives from the Arduino kit. The records for the same will be stored in the database on the server. At the end of each month all the viewing times for a particular channel are added to calculate the monthly viewing time. This process is repeated for all the channels the user has watched throughout the month. The records which are stored in the database are then used for calculating the monthly bill. The records which are then stored in the database are reset every month when the final bill is generated and the same process is repeated each time.



1.4 Mathematical Model

Every channel has a per second cost. Using this cost and the calculated viewing time, the final monthly bill is generated.

$$\text{Monthly channel cost} = (\text{Watching_time_in_sec} \times \text{Monthly_cost}) \div (30 \times 24 \times 3600)$$

Example of a bill :

Channel Name	Cost per month	No of seconds viewed (per month)
Star Sports	Rs.30	324000 (90 hrs)
HBO	Rs.15	216000 (60 hrs)
Disney Channel	Rs.20	108000 (30 hrs)

Star Sports :
Billing Amount = $(324000/2592000) \times 30 = \text{Rs.}3.75$

HBO :
Billing Amount = $(216000/2592000) \times 15 = \text{Rs.}1.25$

Disney Channel :
Billing Amount = $(108000/2592000) \times 20 = \text{Rs.}0.83$

TOTAL BILL: Rs.5.83

3. CONCLUSION

Our system will help to significantly reduce monthly television bill. Since viewing time in seconds is used for bill generation users will be charged only for the amount of service actually used.

4. REFERENCES

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BIOGRAPHIES



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