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Intelligent Life- Improvement of TV Controller

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Abstract. Intellectual life has become a part of modern life. Watching television is now a major part of peoples' leisure time. Previous literatures stated that television viewing would cause personal happiness and good feelings. How humans select their preferred TV channels and enjoy their leisure time is important for them in order to relax themselves. Previous literatures focused on their TV viewing records; however, it is not always pertinent for observing people's habits. A wrinkled brow is able to let the TV know the meaning behind changing channels. It should be based on face recognition and sensors. This research tries to improve the functions of the TV controller, making for an easier life and pursuit of more intelligent viewing. A new innovation finding was to propose, and also model it as mathematics formulas for future studies. Although it is still in mathematic form, perhaps, it would enter mass production someday. Future research also suggests studying multi person feelings, intelligent sensor and control.

Introduction

Intellectual life has become a part of modern life. Watching television has become a major part of peoples' leisure time. Kataria and Regner [1] stated that television viewing would cause personal happiness and good feelings in 2011. They used a large cross-county comparison approach; and found that TV would cause an effect on life satisfaction.

Lai *et al*. [2] discussed a low complexity channel recommendation system on a TV remote controller, which can recommend interesting channels to viewers at various time intervals according to different preferences and habits. This system stored user's previous TV viewing records and suggested channels to the user. Zivkov *et al*. [3] stated that a smart-phone application would be used to double as a TV remote controller. Song and Cho [4] expressed that modern home theater systems require users to control various devices simultaneously including a TV, audio equipment, DVD and video players, and a receiver in 2013. To perform the requested user functions in this situation, the user is required to know the functions and positions of the buttons on several remote controls. Users, confused by so many buttons, find this does not fit for a comfortable leisure time experience. Therefore, the user interface should be adaptable for requested user functions and able to fit a specific control device. They presented a context-adaptive user interface for the control of devices in a ubiquitous home environment. A Bayesian network to predict the necessary and unnecessary devices was used, and their study made human TV life easier. Kim *et al*. [5] presented that IP-connected Smart TV offered more advanced computing ability and connectivity. They presented a home appliance control framework based on a Smart TV set-top box. The purpose of this framework was to keep users leaning back and watching the TV screen and then to provide them with an intuitive and convenient way to monitor and control home appliances.

This research tries to improve the functions of the TV controller, making life easier and the pursuit of a more intelligent daily life. A new innovation finding was to propose, and also model it as mathematics formulas for future studies.

Problem Formulation

This research adapts maximization of customers' utilization, *U*, as the basic model [6]. A dynamic selection model [7][8], previous research, helps this study construct a more precise problem formulation. In this study, let sensor to be a decision variable generator. Let Sen_{ij} denote a binary decision variable of sensor *i* at *j* stage. It spent t_{ij} second(s) at *j* stage to complete this responding action (It is also a dynamic decision variable). Let *TCT* denote total completion time.Let W_{ij} denote satisfication of human for sensor *i* selected spontaneity action at *j* stage. There are *TS* stages in the system. There are *TR* sensors in the system. The MINP is shown as follows.

The MINP (Mixed interger non-linear programming) model to minimize the sensor responding time and maximize customers' utilization is as follows:

$$\textbf{Min} \quad TCT = \sum_{i,j \in N} Sen_{ij} \bullet t_{ij} \tag{1}$$

$$\textbf{Max} \quad U = \sum_{i,j \in N} Sen_{ij} \bullet W_{ij} \tag{2}$$

s.t.

$$\sum_{j \in N} Sen_{ij} = TS \qquad \forall \qquad i \tag{3}$$

$$\sum_{i \in N} Sen_{ij} = TR \qquad \forall \qquad j \tag{4}$$

$$Sen_{ij} \in \{0,1\} \qquad \forall \qquad i, j \tag{5}$$

The objective (1) is to find a minimize sensor responding time. The objective (2) is to find a maximum customers' utilization of satisfaction. In Eq. (3), these are TS stages in the system and each stage must be completed. In Eq. (4), these are TR sensors in the system and each of them must be selected. Eq. (5) declares artificial binary decision variable constraints.

Information flow

Based on problem formulation, the information flow is shown as Fig 1. As a human comes into the living room, the sensor starts the intelligent controller automatically. Then, it turns the TV on and adjusts the screen automatically. After that, it will adjust the audio devices, and scan the human faces. If the human has a bad feeling, then it will try to turn to different channels automatically.

The software indicated that the human needs a more convenient daily life, even if it is only a simple TV controller device.

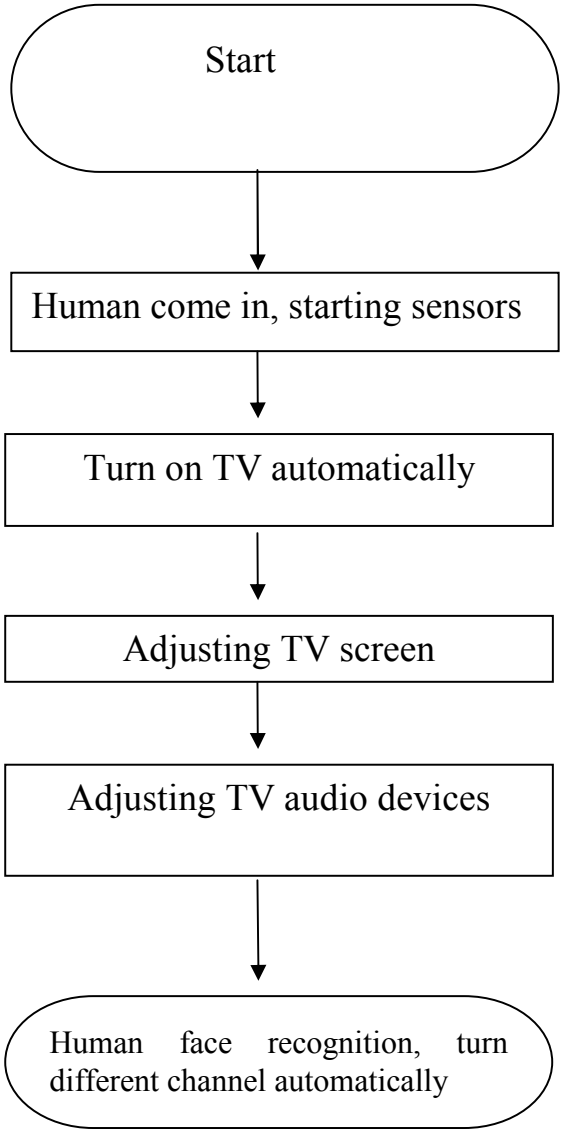

Fig. 1. A flow chart of the TV's intelligent controller

Results and Discussion

This new invention of the TV's intelligent controller has been described in the patent and under review process. Because patents do not protect the mathematical formulas, we proposed the model in section 2.

In this invention, multi human faces sub problems were not considered. Although sensors can evaluate the background noise level, it still does not consider multi person feelings and decides to turn on a suitable common channel.

Conclusion

Improvement of TV controllers is an interesting topic. How humans select their preferred TV channels and enjoy their leisure time is important for them in order to relax themselves. Previous literatures focused on TV viewing records; however, it is not always pertinent for examining people's habits. A wrinkled brow is able to let the TV know the meanings behind changing channels. It should

be based on face recognition and sensors. This study modeled it as mathematics formulas for future studies. Although it is still in mathematical form, perhaps, it would be in mass production someday. Future research suggests studying multi person feelings, intelligent sensor and control.

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