# Technical Disclosure Commons

## Defensive Publications Series

August 02, 2017

# Controlling a television from proximate devices

Adam Glazier

Adam Champy

Michael Sundermeyer

Follow this and additional works at: http://www.tdcommons.org/dpubs_series

## Recommended Citation

# Controlling a television from proximate devices

## ABSTRACT

This disclosure describes techniques to control and interact with displays, e.g., televisions, without a traditional infrared (IR) remote control or a directional pad. An application on a user computing device is used to initiate and control content playback on the television. The app is also usable to update television settings and user settings, e.g., multiple user accounts, multiple mobile devices, user permissions, etc. When permitted by a user, a television automatically detects a proximate user computing device and sends a notification to the detected device. The television also automatically enters a responsive state, without user input to switch on the television.  A notification of the availability of the television is sent to the detected device. A user can wireless transmit content to the television, change television settings, etc. via the computing device.

## KEYWORDS

- Wireless media playback

- Remote control

- Proximity detection

- Cast TV

## BACKGROUND

Televisions traditionally ship with a paired remote control that enables a user to control TV settings as well as navigate through media content. Televisions also support protocols for wireless media playback, directly or via wireless media devices that plug into a port, e.g., an HDMI port. A mobile application executed on a computing device, such as a smartphone, tablet,

or laptop, sends user-selected content, such as TV shows, movies, music, and other media to a television. In such a setup, the television is a main screen and the computing device from which the media content is sent is a second screen. While the media content is being streamed to the television, a user can continue to use the computing device for other user activity.

This setup allows a mobile device to display content on a television; however, it poses challenges. A user can only modify television settings with the TV remote control and not with the computing device. Further, some wireless media devices have their own physical remote controls which makes navigation, e.g., searching for specific media content, less user friendly. Many televisions have a 'soft remote', e.g., a directional pad, that controls the primary operation. Viewing network-streamed media contents on a television can require a user to utilize different input devices to operate the television, e.g., the TV remote control to switch the television on or off, adjust display settings, etc. and a remote control of a wireless media device or a computing device to control playback, navigate content, etc.

There are several challenges in deploying a second-screen computing device to control a television. First, such control requires interaction with TV hardware to enable functions such as selecting inputs, TV settings, etc. Further, enabling such control also requires that TV settings, media content, and auto-detection notification of mobile devices be visible on the second screen. Many devices support hot plug announcements of an event, e.g., "You just plugged in a device," on the television but not on the second screen. A television can support media playback and control via multiple computing devices. In this configuration, managing content playback and input from the multiple devices is a challenge.
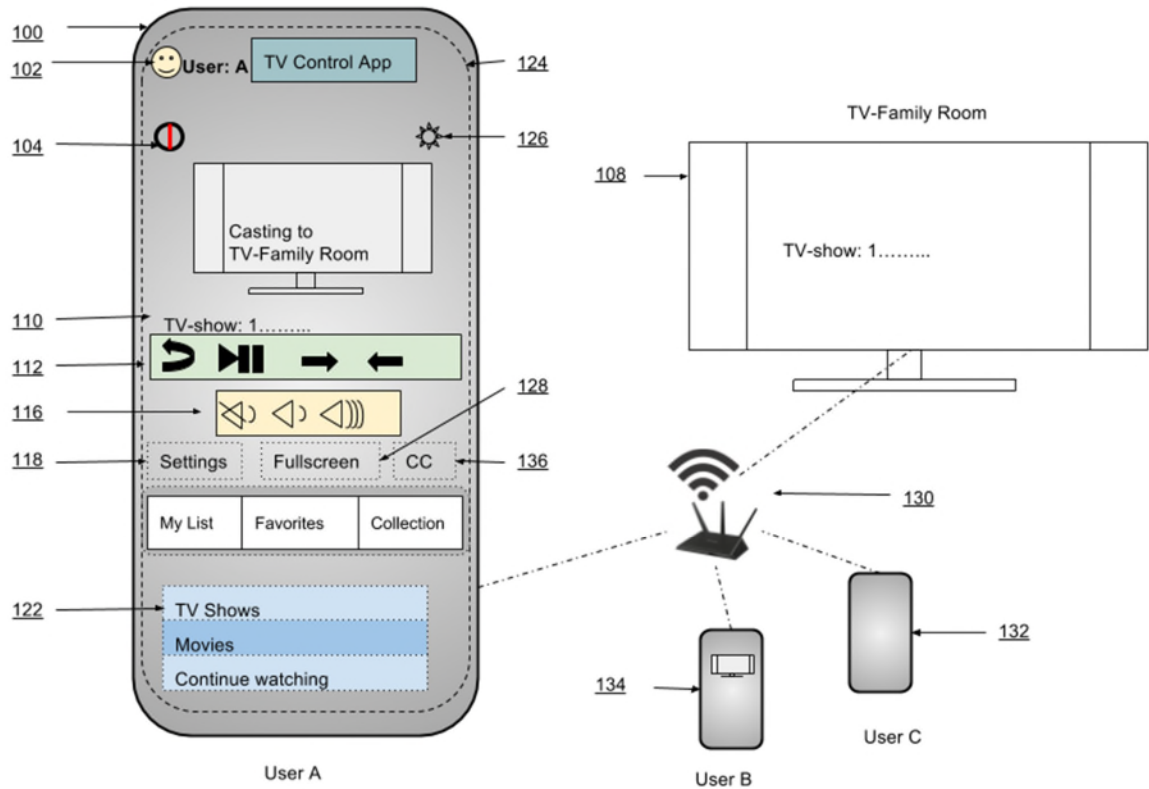
DESCRIPTION



**Fig. 1: Use of a computing device for content playback and control of a television**

Fig. 1 illustrates an example of mobile devices interacting with a television.  In the example shown in Fig. 1, device (100) is a smartphone with a TV control app (124). The app is usable by user A (102) to control a television (108). The smartphone interacts with the television via a wireless network (130). Fig. 1 also shows other devices 132 and 134, e.g., of other users B and C, that are connected to the wireless network. The computing devices 100, 132, and 134 are near the TV.

User A views media content (110) on the TV via the TV control app. In addition to choosing the media content to watch on the TV screen from a list of media content (122), the app

also allows the user to control TV settings via controls displayed on the device, such as power (104), volume (116), display settings, e.g., brightness (126), view area, e.g., full-screen (128), closed-captioning (136), media playback, e.g., play, pause, rewind, etc. (112).

The techniques as disclosed use proximity detection technology during initial setup to detect that a computing device is near a television. These techniques also detect whether the mobile device is set up with requisite permissions for a set of operations on the television. There are different tiers of permissions for such operations. For example, all authenticated users are configured such that user devices of those users can be operated to power the television on or off. However, only specific users are permitted to change settings for the television.

In the example shown in Fig. 1, user A has permissions to change television settings (118). User B has permissions to turn the television on or off, and view media content but not to control settings. User C is not authorised for control of the television. When computing devices of users A or B are near the television, the television automatically detects the devices. Such detection is announced on the respective device via a notification, e.g., a notification that includes the name and device type, e.g., "TV-Family room," e.g., as illustrated on the display of devices 100 and 134. Since user C is not authorised for automatic control of the television, there is no such notification on device 132. Multiple devices can be configured with different permissions for the television, e.g., all devices in the same room as the television, all mobile devices on the same network (e.g., 130) as the television, etc.
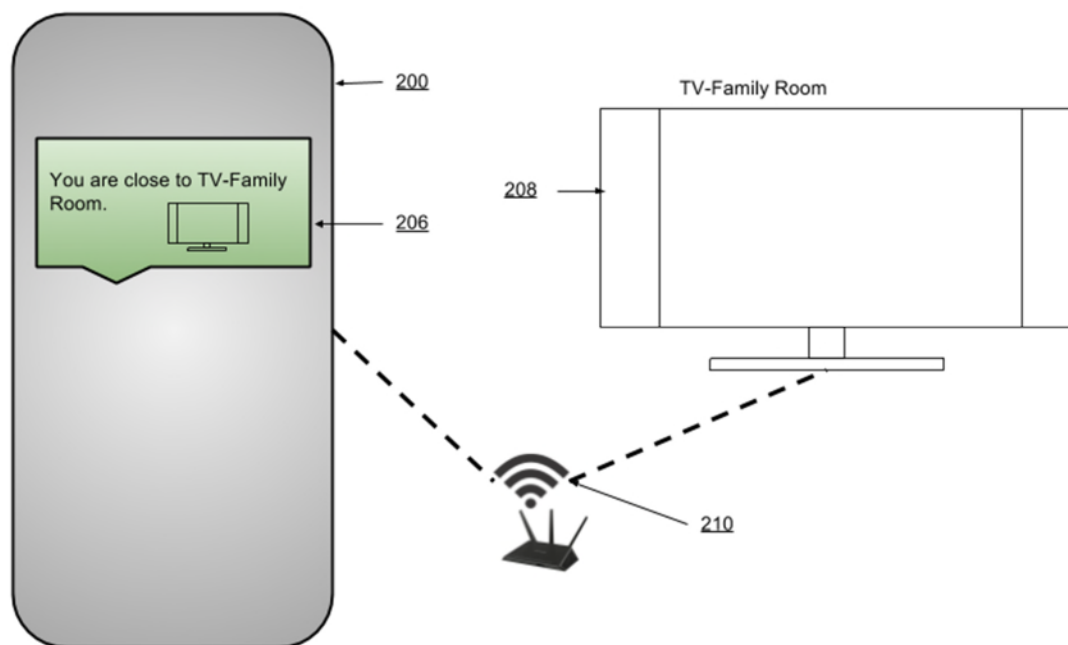
You are close to TV-Family Room.

TV-Family Room

**Fig. 2: Auto-detection of a user device by a television**

When a television that implements techniques disclosed herein detects a computing device that has TV control or wireless media playback capability, it enters a more responsive state. This transition is faster than if a user used traditional methods such as switching on the television using a physical power button or a remote control. The automatic detection of a computing device, e.g., a smartphone or a tablet, can be triggered in several ways. For example, a change in power state of the mobile device, recognizing that media content is received at the television, or by a combination of such signals. Upon recognition that a television and a mobile device are proximate, a notification appears on the mobile device. Fig. 2 illustrates an example of auto-detection of a mobile device by a television. Mobile device (200) is configured with permissions to interact with a television (208) in a family room. The mobile device and television are connected to a wireless network (210). When the device is in close proximity to the television, a notification (206) is automatically displayed. Further, the television enters a

more responsive state such that if the user B taps on the notification and selects a media content to view on the television, the television can respond quickly.

The user can choose to view content on the television, choose settings to modify, or ignore the notification. For example, when user A enters the family room while playing a video on her smartphone, the television automatically enters a responsive state and sends a notification to the smartphone that the television is available for content playback. If user A chooses to play content on the television, the video is displayed on the television. Alternatively, user A can dismiss the notification (e.g., continue to watch the video on the smartphone), choose to automatically view content on the television, or change a setting to turn off notifications. Further, user A can choose to not show a notification in future and instead automatically start display of content on the television whenever the user plays videos on that particular video playing app and is near the television.

The techniques disclosed herein also enable users to indicate problems with viewing content on the television, e.g., provide feedback regarding the displayed image quality. The techniques can also provide screen snapshots. The user can select specific display settings for the television.

CONCLUSION

The techniques described herein automatically detect user computing devices, e.g., smartphones, tablets, laptops, etc. that are proximate to a television that has wireless media playback capability. Such user computing devices are configured, e.g., with an application, that enables users to interact with the television and control television settings. User devices can be provided specific permissions, based on user identity, location (e.g., in the same room as the

television), connectivity (e.g., connected to same wireless network as the television), etc. The techniques enable a television to automatically enter a responsive state when a user computing device is detected. Further, upon detection that a television and a user computing device are in proximity, notifications are displayed on the user computing device. The notifications enable a user to wirelessly send content to the television, control television settings, etc. In this manner, television units can be controlled via a user computing device, without a traditional remote control.