(12) **United States Patent**　　　　(10) **Patent No.:**　　**US 8,937,685 B1**
Ho et al.　　　　　　　　　　　　　(45) **Date of Patent:**　　**Jan. 20, 2015**

(54) **METHOD AND SYSTEM FOR OVERLAYING VIDEOS IN A TELEVISION SET USING A TELEVISION SCRIPT**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1135 days.

(21) Appl. No.: **12/248,768**

(22) Filed: **Oct. 9, 2008**

(51) **Int. Cl.**
　　H04N 5/45　　　　(2011.01)
　　H04N 5/445　　　(2011.01)
　　H04N 5/93　　　　(2006.01)
　　H04N 7/173　　　(2011.01)
　　G06F 3/00　　　　(2006.01)

(52) **U.S. Cl.**
　　USPC **348/565**; 348/564; 348/567; 348/568; 386/281; 715/700; 715/718; 715/719; 715/722; 715/723; 715/741; 715/742; 715/743; 715/131; 725/32; 725/37; 725/109; 725/110; 725/120

(58) **Field of Classification Search**
　　USPC 386/281; 348/E5.097, E5.104, E5.105, 348/E5.108, E5.112, 565, 564, 567, 568, 348/588, 581, 607, 910, E5.11, E7.012; 715/719, 718, 722, 723, 810, 741, 742, 715/743, 700; 725/37, 63, 68, 109, 110, 725/120, 131, 32; 709/229; 375/E7.025, 375/E7.268
　　See application file for complete search history.

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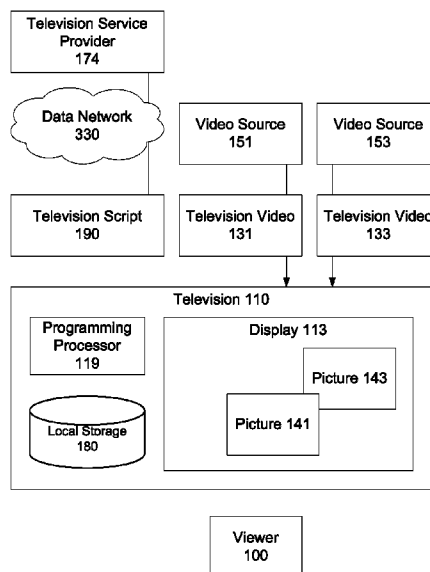* cited by examiner

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(57) **ABSTRACT**

Method and system for overlaying videos in a television include: receiving a plurality of video signals directly from a plurality of video sources by the television; receiving and processing a script by the television, the script includes instructions for placing a first picture from a first video signal of the plurality of video signals in a first position at a first depth value on a display coupled to the television, and instructions for placing a second picture from a second video signal of the plurality of video signals in a second position at a second depth value on the display; and simultaneously displaying the first picture and the second picture on the display by the television in an overlayed manner, the first picture being displayed at the first position and at the first depth value, the second picture being displayed at the second position and at the second depth value.
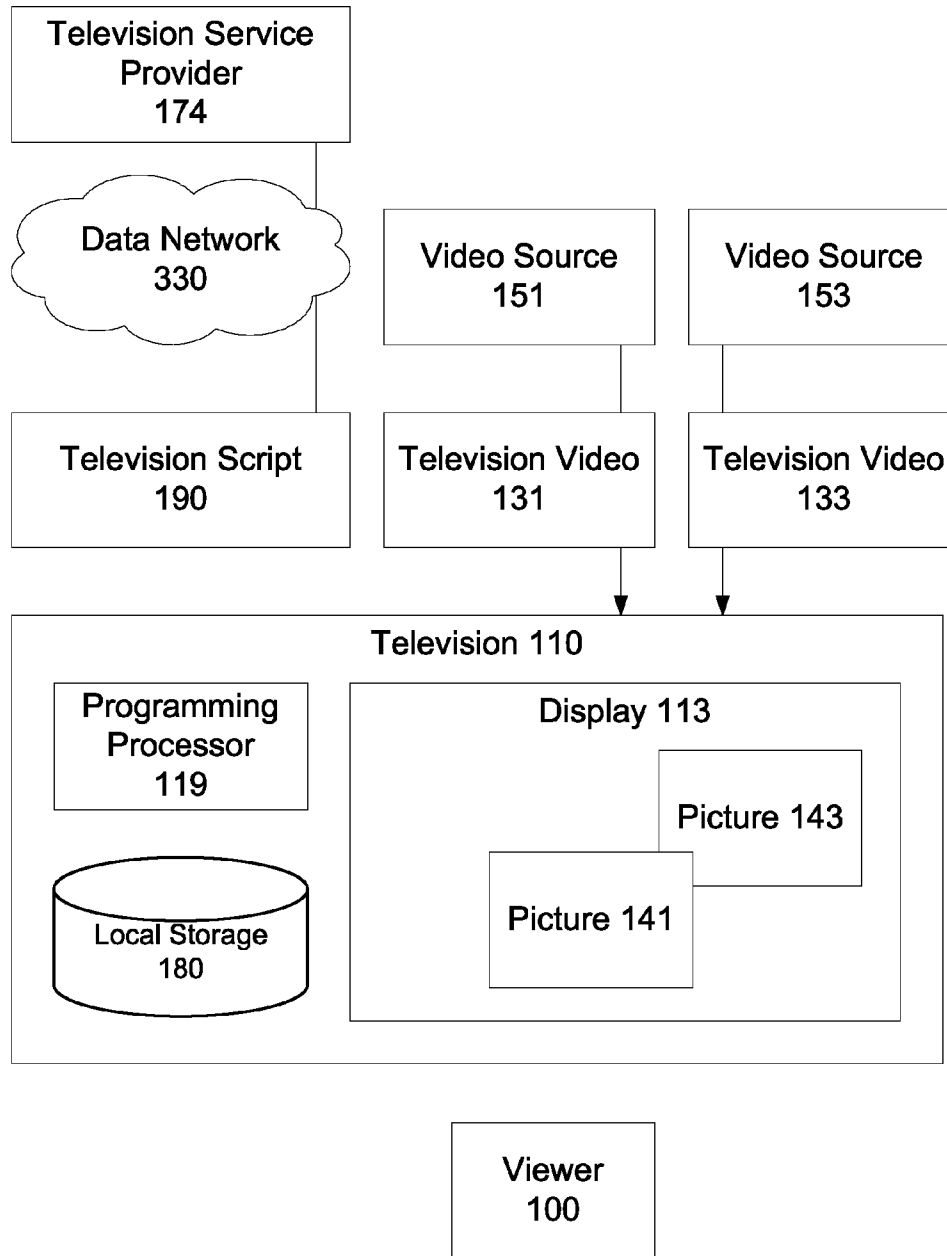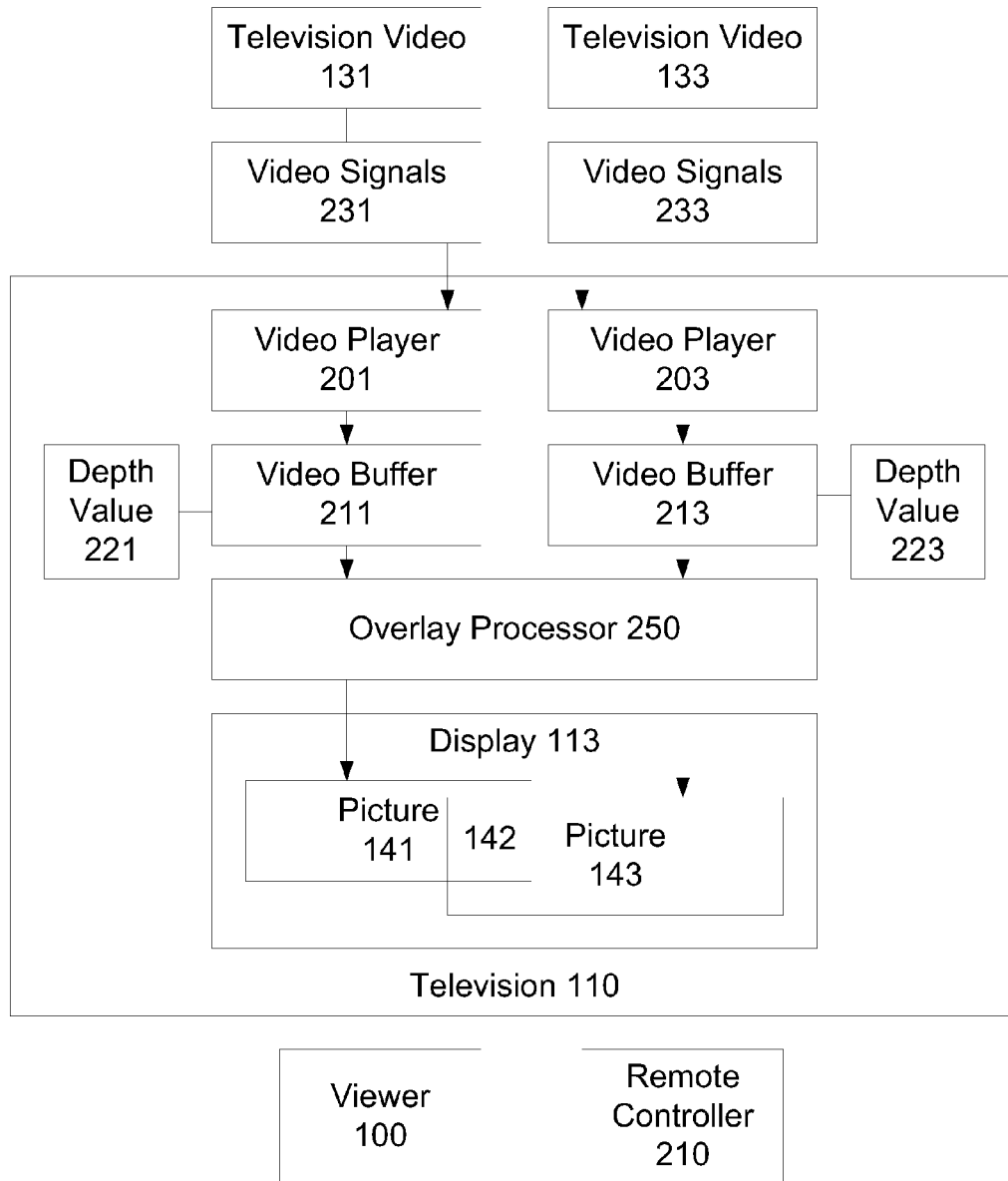
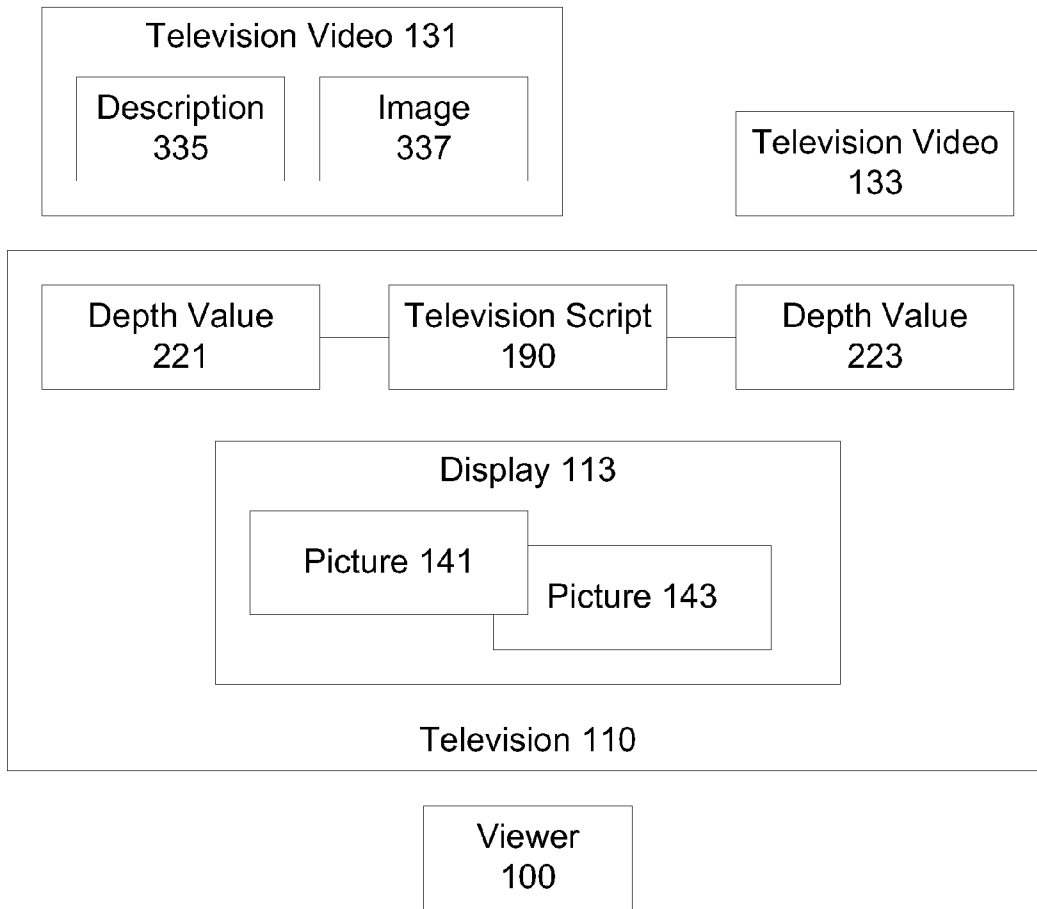**38 Claims, 4 Drawing Sheets**

FIG. 1

FIG. 2

Television Video 131

| Description 335 | Image 337 |

Television Video 133

Depth Value 221 — Television Script 190 — Depth Value 223

Display 113

Picture 141

Picture 143

Television 110

Viewer 100

FIG. 3

Television Service Provider
174

Television Service
374

Television Video
131

Television Script
192

Television Video
133

Television Script
190

Display 113

Picture 141

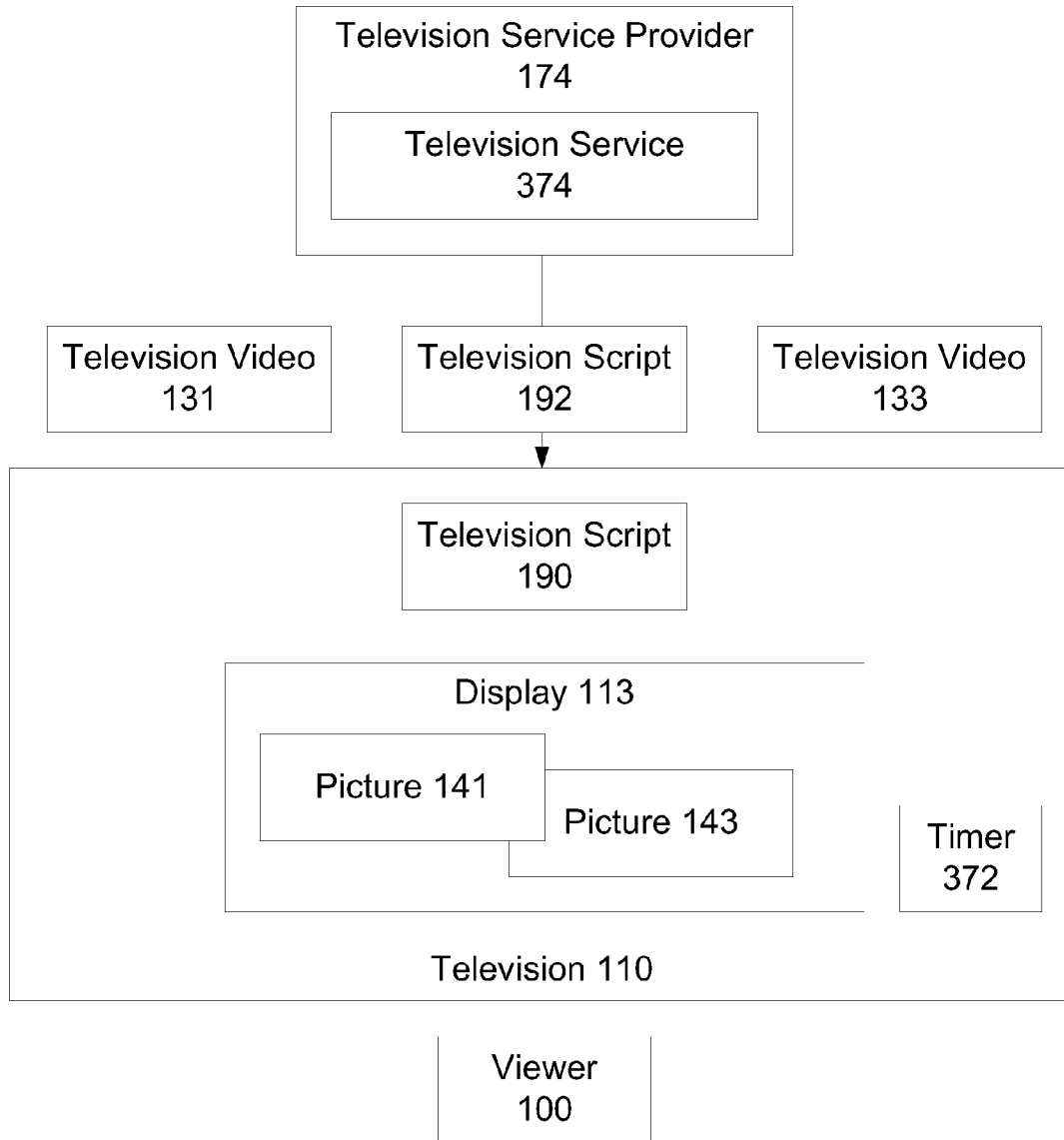Picture 143

Timer
372

Television 110

Viewer
100

FIG. 4

METHOD AND SYSTEM FOR OVERLAYING VIDEOS IN A TELEVISION SET USING A TELEVISION SCRIPT

BACKGROUND OF THE INVENTION

1. Field

This invention relates generally to media, particularly to a system and method to overlay videos from multiple sources in a television set.

2. Related Arts

Television is often considered as a broadcast media, where the video content is controlled by television broadcasters. Broadcasters decide on what to show to consumers or viewers, and broadcasters dictate what consumers can see. Sometimes, when a broadcaster determines that multiple contents can be shown, the broadcaster combines the content into a single video signal and broadcasts the signal to the viewers. A viewer cannot choose one content over another, or a different combination of content. Let alone different viewers may prefer different choices of the combinations.

In one embodiment, John is watching a NFL football game on ESPN channel. During half time, ESPN decides to show the half time show with an overlay of a commentator summarizing the first half, and live interviews of several coaches and football players from other NFL teams. John is interested only in the half time show, but he cannot turn off the overlay videos. Jack is watching the same game. Jack, however, is interested in the interviews while watching the half time show. Unfortunately ESPN shows more videos of the summary than the interviews, even though the remaining interview video footage is available on ESPN's website. Jack is not happy about that.

In one embodiment, Tina watches every morning CNBC to check the financial and business news. Though Tina is definitely interested in the news, she thinks she can listen to them without watching the television. However, she is keen on the stock tickers on the screen. She wants the tickers to be more visible with larger letters and numbers. She does not have a choice as CNBC chooses the small text size for the tickers.

In one embodiment, a broadcaster does not want its video content to be shown together with video content from another broadcaster, opposite to consumers' desire. In one embodiment, John prefers to hear commentators from NBC Sports on the football game shown in ESPN channel. John wants to have an overlay video picture of NBC Sports anchorman to talk about the game while John watches the game telecasted by ESPN. In another embodiment, Tina wants to have two overlay pictures, one from CNN showing world news, and one from a local television station going over local weather and news, while she watches CNBC every morning.

In another embodiment, John watches a telecast football game in a local sports bar. The sports bar wants to put advertisements on the television set about their beverage and food menu. The bar wants also to advertise the weekly Friday night happy hour appetizer specials. Ideally the advertisements are displayed as overlay animations on the television set in the sports bar, similar to many typical overlay advertisements run by ESPN. The sports bar is interested only to advertise on the television sets in the bar, and is not willing to pay big money to purchase an advertisement slot with ESPN, which will show the televisions to millions of viewers who do not live near the bar or are not interested in sports bar.

In yet another embodiment, Jack purchases his television set from a local retail store at a discounted price. The television set connects to Internet. The retail store wants to use the television set to run promotion videos from the store's web

site. The promotion videos are most effective when Jack watches sport games. For example, the retail store wants to run announcement of local sport events such as little league baseball games, sales of skiing equipment, profiles of athletics of a local high school. When Jack is watching a sports television program, the store wants to know the sports program and plays the corresponding promotion videos overlaying on top of the sports program on the television set.

The above embodiments illustrate a need to provide a method and a system to overlay a plurality of videos in a television set.

BRIEF SUMMARY OF THE INVENTION

The invention provides a method and system for overlaying videos in a television using a television script. In a method aspect, the invention comprises: receiving a plurality of video signals directly from a plurality of video sources by the television; receiving and processing a first script by the television, the first script comprising instructions for placing a first picture from a first video signal of the plurality of video signals in a first position at a first depth value on a display coupled to the television, and instructions for placing a second picture from a second video signal of the plurality of video signals in a second position at a second depth value on the display; and simultaneously displaying the first picture and the second picture on the display by the television in an overlayed manner, the first picture being displayed at the first position and at the first depth value, the second picture being displayed at the second position and at the second depth value.

In one aspect, the first picture is displayed as at least partially covering the second picture. In another aspect, the first picture is displayed as overlaying translucently on top of the second picture, wherein the second picture is at least partially visible.

In another feature, the method further comprises: receiving and processing a second script by the television, the second script comprising further instructions for placing the first picture and the second picture on the display, wherein the second script comprises a different depth value for the first picture or the second picture; and simultaneously displaying the first picture and the second picture on the display by the television, wherein the overlay display of the first and second pictures are changed according to the different depth value.

In one aspect, the first video signal comprises a description, wherein the television performs a video search on the plurality of video signals based on the description, where a result of the video search comprises a second video signal.

In an apparatus aspect, the invention comprises: a plurality of interfaces for receiving a plurality of video signals directly from a plurality of video sources; a first video player for processing a first video signal of the plurality of video signals; a first video buffer for storing a first picture from the processed first video signal, the first video buffer being associated with a first depth value; a second video player for processing a second video signal of the plurality of video signals; a second video buffer for storing a second picture from the processed second video signal, the second video buffer being associated with a second depth value; a local storage for storing a script, the script comprising instructions for placing the first picture at a first position at the first depth value and instructions for placing the second picture at a second position at the second depth value; and an overlay processor for processing the first video buffer by rendering the first picture in the first video buffer at the first position at the first depth value onto a display coupled to the television, for processing

the second video buffer by rendering the second picture in the second video buffer at the second position at the second depth value, the first and second pictures being displayed simultaneously in an overlayed manner.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE FIGURES

FIG. **1** illustrates a television set with overlaying videos.

FIG. **2** illustrates a process for overlaying pictures.

FIG. **3** illustrates a television script automatically changing overlaying effects.

FIG. **4** illustrates a process of changing the overlay by a second television script.

DETAILED DESCRIPTION OF THE INVENTION

FIG. **1** illustrates a television set with overlaying videos.

Viewer **100** is watching television **110**. Television set or television **110** is a consumer electronic device, typically for watching broadcast television, cable or satellite television, or IP television. Television **110** receives a television video **131** from a video source **151**.

In one embodiment, television **110** includes a High Definition Television (HDTV) set. In one embodiment, television **110** includes a digital media adaptor. In one embodiment, television **110** includes a Video Cassette Recorder (VCR), or a Digital Video Recorder (DVR). In one embodiment, television **110** includes a set-top-box. In one embodiment, the set-top-box includes a personal computer (PC), a notebook or a netbook. In one embodiment, television **110** includes a mobile entertainment device such as a smartphone, mobile internet device (MID) or a NetTop. In one embodiment, television **110** includes a PumpTop television. In one embodiment, television **110** includes a digital video signage, a kiosk, or a digital billboard. In one embodiment, television **110** includes a digital video scoreboard used in sports venue. In one embodiment, television **110** includes an all-in-one TV. In one embodiment, television **110** includes a touch sensitive screen. In one embodiment, television **110** is located in a living room, a family room, or a bedroom. In one embodiment, television **110** is located in a residential entertainment room.

In one embodiment, television **110** is placed on a low-profile table, or hung on a wall. In one embodiment, television **110** is located in a restaurant, a sports bar, or a shopping mall. In one embodiment, television **110** is located in an airport, a hotel lobby, a hotel guestroom, or a casino. In one embodiment, television **110** is located over a gas pump in a gas station. In one embodiment, television **110** is located in a retail store, in a bank, a supermarket or a department store. In one embodiment, television **110** is located in a reception area of a dental office, a clinic, a hospital, or a governmental office. In one embodiment, television **110** is located in a ball park, a stadium or a public place, such as a town-square, subway station, or a street corner. In one embodiment, television **110** is located in an elevator, a billboard, or a digital kiosk. In one embodiment, television **110** is located in a class room, a lecture hall, or a corporate conference room. In one embodiment, television **110** is located in an airplane, a passenger car, a bus or a train.

In one embodiment, television video **131** includes a stream of video and audio signals, such as Real Time Messaging Protocol (RTMP) signals, Moving Pictures Expert Group-1 (MPEG-2) signals, MPEG-4 signals, H.264, Windows Media Video (WMV), QuickTime video, On2 VP6-based signals, Digital Video Broadcasting Terrestrial (DVB-T), Digital

Video Broadcasting Handhelds (DVB-H), or analog signals such as National Television System Committee (NTSC), or Phase Alternating Lind (PAL) signals. In one embodiment, television video **131** includes a Media RSS document or a Synchronized Multimedia Integration Language (SMIL) document. In one embodiment, television video **131** is a television show. In one embodiment, television video **131** is a movie. In one embodiment, television video **131** is a news broadcast. In one embodiment, television video **131** is a televised event, such as a National Football League (NFL) game, an Olympics track and field event, or Miss Universe Pageant. In one embodiment, television video **131** is a documentary, a web video, or a city council meeting broadcast. In one embodiment, television video **131** is an advertisement. In one embodiment, television video **131** is an animation, or a cartoon animation.

In one embodiment, video source **151** is a broadcast television network, such as a cable television network, a satellite television network, or terrestrial television network, also known as over-the-air (OTA) television network. In one embodiment, video source **151** is a broadband television network. In one embodiment, video source **151** is based on Internet Protocol Television (IPTV) technologies. In one embodiment, video source **151** is an Internet video portal or online video syndicate. In one embodiment, video source **151** is an on-line video rental service. In one embodiment, video source **151** is a web portal. In one embodiment, video source **151** is a home media center, a PC, a cable set-top box, a digital set-top box such as Sling, or Apple TV.

Television **110** includes interfaces for directly receiving video signals from a plurality of video sources. Television **110** connects to video source **151**. In one embodiment, television **110** connects to video source **151** over a radio frequency (RF) interface, or a composite video input interface. In one embodiment, television **110** connects to video source **151** over a media component interface, such as an YCbCr interface. In one embodiment, television **110** connects to video source **151** over a High Definition Multimedia Interface (HDMI) or Digital Video Interface (DVI). In one embodiment, television **110** connects to video source **151** over a network interface, such as an Ethernet interface. In one embodiment, television **110** connects to video source **151** over a wireless network interface such as a Wireless Local Area Network (WLAN), a Worldwide Interoperability for Microware Access (WiMax) network, an Ultra-Wideband (UWB) network, or a 3G network interface. In one embodiment, television **110** connects to video source **151** over a cable modem interface or a Digital Subscriber Line (DSL) interface. In one embodiment, television **110** connects to video source **151** using Bluetooth, Data Over Cable Service Interface Specification (DOCSIS) 3.0, or Multimedia Over Coax Alliance (MoCA) technologies.

In one embodiment, television **110** includes a display **113**. Display **113** includes a picture **141**. Television **110** plays television video **131** onto picture **141**. In one embodiment, display **113** includes a Cathode Ray Tube (CRT) screen, a Liquid Crystal Display (LCD) screen, or a plasma display panel. In one embodiment, display **113** includes a video projector or a video monitor. In one embodiment, display **113** has a screen size of 40 inches, 3.5 inches, 120 inches or 17 inches.

In one embodiment, television **110** connects to display **113**. In one embodiment, television **110** connects to display **113** using an HDMI, a Digital Video Interface (DVI), a Universal Serial Bus (USB), IEEE 1394 (Firewire), a Video Graphics Array (VGA), or an S-video connector or cable. In one embodiment, television **110** connects to display **113** over a radio frequency (RF) interface. In one embodiment, televi-

sion **110** connects to display **113** over a media component connector or cable, such as analog RCA or digital YCbCr connector or cable.

Television **110** processes a television script **190**. Television **110** includes a programming processor **119** capable of processing television script **190**. In one embodiment, programming processor **119** includes a micro-processor, such as Intel Pentium. Celeron, Atom, an AMD micro-processor, or a VIA micro-processor. In one embodiment, programming processor **119** includes an embedded micro-processor based on RISC architecture such as the MIPS, PowerPC, or ARM architecture. In one embodiment, programming processor **119** includes a multi-core processor, such as Intel's Core 2 Duo processor, or AMD's Opteron Quad-Core processor. Television **110** processes television script **190** using programming processor **119**. Television script **190** includes one or more programming instructions to place picture **141** onto a position on display **113**. In one embodiment, television script **190** is encoded in Extensible Markup Language (XML). In one embodiment, television script **190** is encoded in EMCA-Script or Javascript. In one embodiment, television script **190** is encoded in Java. In one embodiment, television script **190** is encoded in a web scripting language, such as Hypertext Markup Language (HTML). In one embodiment, television script **190** is encoded in Visual Basic Script (VBScript). In one embodiment, television script **190** is encoded in the Common Language Infrastructure (CLI). In one example, television **110** processes television script **190** to place picture **141** with a size of 640×480 pixels from a top left position of (10, 10) to a bottom right position of (650, 490). In one example, television script **190** places picture **141** with a size of 0.5×0.3 from a top left corner of (0.1, 0.1) to a bottom right corner of (0.6, 0.4). In one embodiment, the placement is based on pixels, inches or centimeters. In one embodiment, television script **190** includes programming instructions to specify television video **131** is to be played onto picture **141**. Television **110** processes television video **131** and picture **141** according to television script **190**.

Similarly, television **110** processes a second television video **133** from video source **153**. Television video **133** is played onto picture **143**, which is included in display **113**. In one embodiment, television script **190** includes programming instructions for picture **143** and television video **133**, similar to those for picture **141** and television video **131**.

In one embodiment, television **110** processes television script **190** to place picture **141** and picture **143** in an overlay manner. Television script **190** includes programming instructions to overlay picture **141** over picture **143** on display **113**. In one embodiment, picture **141** overlays on top of picture **143**. In one embodiment, picture **141** overlays partially on top of picture **143**. In one embodiment, picture **141** overlays translucently on top of picture **143** where picture **143** is partially visible. In one embodiment picture **141** is larger than picture **143**. In another embodiment, picture **143** is larger than picture **141**.

In one embodiment, picture **141** overlaps with picture **143** on display **113** such that viewer **100** sees picture **141** and not picture **143** in the overlap area. In one embodiment viewer **100** sees picture **141** with a translucent view of picture **143** in the overlap area. In one embodiment, the overlap area includes the entire picture **141**, entire picture **143**, or part of either picture **141** or picture **143**. In one embodiment, television **110** continues playing television video **131** and television video **133** while picture **141** and picture **143** are displayed simultaneously in an overlay manner on display **113**. In one embodiment, picture **141** and picture **143** overlap and

change position over time so that during some time period picture **141** is visible and during other time periods picture **143** is visible.

Television **110** obtains television script **190** over a data network **330** and stores the television script **190** in local storage **180**. The local storage **180** is a computer readable medium that stores the programming instructions of the television script **190**. In one embodiment, data network **330** includes the Internet. In one embodiment, data network **330** includes an Internet Service Provider (ISP) network. In one embodiment, data network **330** includes a Content Delivery Network (CDN). In one embodiment, data network **330** includes a private network operated by or for a business, such as a hotel, a multi-tenant complex, a gym, a rehabilitation center, or a casino. In one embodiment, data network **330** includes a home network. In one embodiment, data network **330** includes a broadband network. In one embodiment, data network **330** includes an Ethernet. In one embodiment, data network **330** includes a WiFi network. In one embodiment, data network **330** includes a wireless network such as a Wireless Local Area Network (WLAN), a Worldwide Interoperability for Microware Access (WiMax) network, or an Ultra-Wideband (UWB) network. In one embodiment, data network **330** includes a cellular network, such as a 3G network. In one embodiment, data network **330** includes a digital television network such as a cable television network, a satellite television network, or an IPTV network like Verizon's FiOS or AT&T's U-Verse. In one embodiment, data network **330** includes a digital subscriber line (DSL) network or cable broadband network. In one embodiment, data network **330** includes fiber based subscriber broadband network.

In one embodiment, television **110** obtains television script **190** from a television service provider **174** and stored the script **190** in the local storage **180**. In one embodiment, television service provider **174** includes a television programming network, a television syndicate, or a television station. In one embodiment, television service provider **174** includes a television programming guide network. In one embodiment, television service provider **174** includes a cable television network, or a satellite television network. In one embodiment, television service provider **174** includes an advertisement agency. In one embodiment, television service provider **174** includes a web portal of a sports television network. In one embodiment, television service provider **174** includes a CDN.

FIG. **2** illustrates a process for overlaying pictures.

Television **110** includes a video player **201**, and a video buffer **211**. In one embodiment, television script **190** includes programming instructions for video player **201**. Television script **190** instructs video player **210** to process television video **131**. Video player **201** processes television video **131**. Video player **201** receives a stream of video signals **231** of television video **131**, processes the video signals **231** and places the picture output into video buffer **211**.

In one embodiment, video player **201** includes a software media player such as Adobe Flash Player, Adobe Media Player, Microsoft Silverlight, or Windows Media Player. In one embodiment, video player **201** includes a standalone or embedded software application capable of playing back video signals **231**. In one embodiment, video player **201** includes a special purpose DSP (digital signal processor) or microcontroller such as a Broadcom media processor, TI media processor or a Sigma Designs media processor. In one embodiment, video player **201** includes a general purpose central processing unit (CPU), such as Intel Pentium or Atom processor. In one embodiment, video player **201** includes integrated circuits (ICs) such as ARM9 or ARM11 cores. In

one embodiment, video player **201** includes a video capable graphics processor. In one example, the graphics processor is an integrated graphics processor such as the Intel graphics processor, AMD graphics processor or NVIDIA graphics processor. In one example, the graphics processor is included in another processor.

In one embodiment, video buffer **211** includes system memory such as DRAM. In one embodiment, video buffer **211** includes video memory addressable by a graphics processor. In one embodiment, pictures **141** and **143** are stored in separate areas in video buffer **211**.

Television **110** associates video buffer **211** with a depth value **221**. Different video buffers are associated with different depth values. Depth value **221** represents a depth perspective for the viewer **100**. In one embodiment, the larger the depth value **221**, the further away picture **141** looks from the perspective of viewer **100**.

In one embodiment, depth value **221** includes an integral or floating point number. In another embodiment, depth value **221** includes a tag such as "front", "middle", or "back". In another embodiment, depth value **221** is associated with the position of pictures in a data structure such as a stack. In yet another embodiment, depth value **221** is determined using a graphics programming API such as OpenGL or DirectX.

In one embodiment, television **110** includes an overlay processor **250**. In one embodiment, overlay processor **250** includes a software library such as OpenGL or DirectX. In one embodiment, overlay processor **250** includes an integrated circuit such as a Broadcom media processor, TI media processor, or integrated or discrete graphics processors from Intel, ATI or NVidia. In one embodiment, overlay processor **250** includes graphics programming capabilities such as vector graphics, 2D graphics, 3D graphics.

In one embodiment, television script **190** includes programming instructions which are processed by the programming processor **119**. The programming processor **119** then instructs the overlay processor **250** to render picture **141** using video buffer **211** and depth value **221**.

Overlay processor **250** processes video buffer **211** by rendering the contents of video buffer **211** onto picture **141** on display **113**. Overlay processor **250** obtains depth value **221** and video buffer **211** from television script **190** and takes into consideration of depth value **221** when rendering picture **141**.

Television **110** includes a second video player **203**, and a video buffer **213**. Television script **190** includes programming instructions for video player **203** to process television video **133**. Video player **203** processes television video **133**. Video player **203** receives a stream of video signals **233** of television video **133**, processes video signals **233** and places the picture output into video buffer **213**. Video buffer **213** is associated with a depth value **223**. Television script **190** includes programming instructions for overlay processor **250** to render picture **413** using video buffer **213** and depth value **223**. Overlay processor **250** obtains depth value **223** and video buffer **213** from television script **190** and takes into consideration of depth value **223** when rendering video buffer **213** onto picture **143**.

In one embodiment, depth value **223** is smaller than depth value **221**, picture **143** overlaps with picture **141** in region **142**. Picture **143** appears closer to viewer **100** than picture **141**. In one embodiment, depth value **223** is "front" or "top", indicating picture **143** appears closer to viewer **100** than picture **141**. When overlay processor **250** combines video buffers **211** and **213** onto pictures **141** and **143**, overlay processor **250** renders video buffer **213** onto picture **143**, including region **142**. Overlay processor **250** renders video buffer **211** onto picture **141**, excluding region **142**. Viewer **100** sees

television video **133** on region **142** and not television video **131** on region **142**. Viewer **100** sees picture **143** overlays on to picture **141**.

In one embodiment, television script **190** includes programming instructions for graphics or overlaying effects. In one embodiment, the graphics or overlaying effects includes shadow, translucence, refraction, or reflection. In one embodiment, the graphics or overlaying effects includes 2D or 3D operations such as rotation, scaling, translation, animation or spinning Overlay processor **250** obtains the graphics or overlaying effects from television script **190** and applies the graphics or overlaying effects onto picture **141** or region **142**. In one embodiment, overlay processor **250** renders picture **143** with a 3D operation such as rotation, translation, magnification, shrinking, texturing, or any 3-dimension animation operation. Picture **143** overlays with picture **141** during the operation. In one embodiment, overlay processor **250** renders picture **143** with a 2D operation such as scaling, moving, blinking, flashing, rotation, spinning, or any 2-dimension animation operation. Picture **143** overlays with picture **141**.

In one embodiment, television **110** includes a user interaction. In an embodiment, television script **190** includes programming instructions to allow viewer **100** to select picture **141** or picture **143**. In one embodiment, viewer **100** uses a remote controller **210** to select. In one embodiment, picture **143** overlays over picture **141**. Viewer **100** selects picture **143** when the remote controller **210** points to region **142**. In one embodiment, picture **143** has a translucent effect, viewer **100** selects picture **141** when remote controller **210** points to region **142**. In one embodiment, when picture **143** overlays over picture **141**, picture **141** becomes not selectable when remote controller **210** points to any place in picture **141**. In one embodiment, picture **143** partially overlays over picture **141**, and when remote controller **210** selects picture **141**, picture **141** now overlays over picture **143**.

FIG. **3** illustrates television script **190** automatically changing overlaying effects.

In one embodiment, television script **190** specifies depth values **221** and **223**.

In one embodiment, television video **131** includes a description **335**, wherein television script **190** performs a video search based on description **335**. In one embodiment, the search result includes television video **133**. Television script **190** includes depth value **223** and display region for display of the search results. In one embodiment, television **110** obtains description **335** when the viewer **100** selects picture **141** with remote controller **210**. In another embodiment, television **110** obtains description **335** when a timer expires. In yet another embodiment, television **110** obtains description **335** in response to a network event. In one example, television service provider **174** sends a message to television **110** to trigger television **110** to obtain description **335**.

In one embodiment, description **335** is encoded in Extensible Markup Language (XML). In one embodiment, description **335** is encoded in a web scripting language such as Javascript or HTML. In one embodiment, description **335** is stored in television **110**. In another embodiment, description **335** is retrieved over data network **330**.

In one embodiment, description **335** includes information about television video **131**, such as the name of the program, the cast, a summary of the plot, or user reviews. In one embodiment, description **335** includes a time stamp, such as the current time of day. In one embodiment, description **335** includes demographic information of viewer **100**. In one

embodiment, description **335** includes information about services subscribed to by viewer **100**.

In one embodiment, television video **131** includes an image **337** of an actor. In one example, television video **131** is a television show and image **337** is an actor of the television show. Television script **190** includes programming instructions to determine a person based on the facial characteristics the image **337** (such as search in the Internet), as well as programming instructions to search for videos related to the person. In one embodiment, description **335** describes the image **337**. In one embodiment, image **337** is a snapshot of television video **131**. In another embodiment, image **337** is obtained separately through a network based on description **335**. In another embodiment, image **337** is sent together with television video **131**, for example, as part of Media RSS or SMIL. In one embodiment, image **337** is displayed on picture **141**. In another embodiment, image **337** is not displayed on picture **141**.

In one embodiment, image **337** includes an object such as a car. Television script **190** includes programming instructions to determine characteristics of a car, and programming instructions to determine the make and model of a car (such as search in the Internet), as well as programming instructions to search videos related to the car. In a similar embodiment, object is merchandise such as a cell phone, a purse, a pair of boots, a diamond ring, or a dress. Television script **190** includes programming instructions to determine characteristics of the merchandise, and programming instructions to determine a merchant, as well as programming instructions to search videos related to the merchandise or merchant.

FIG. **4** illustrates a process of changing the overlay by a second television script.

Television **110** may determine to obtain a second television script **192** that contains different instructions for processing the overlay of pictures **141** and **143**. The second script may contain different depth values and/or placements for the pictures **141** and **143**. There are different reasons to obtain second television script **192**. For example, television **110** decides to display a logo for television service provider **174**; to show an advertisement; to show an advertisement tailored for viewer **100**; to show a pop-up animation; to show a highlight picture or video of a sport game; to display an actor profile; to display news, sports or stock updates; to alert viewer **100** of an event such as important news, an upcoming television show, or the next video; or to alert viewer **100** of an emergency.

In one embodiment, television script **190** includes instructions to obtain second television script **192**.

In one embodiment, television script **190** determines television video **131** requires a second television script **192**, and instructs television **110** to obtain television script **192**. In one example, television video **131** is a sport television show, and television video **133** includes a replay of the last touchdown. Television script **190** instructs television **110** to obtain television script **192** which has the overlay instructions to process television video **133** and television video **131**. In one embodiment, television video **131** is a movie, and television video **133** includes a chapter selection, wherein viewer **100** can select a chapter. Television script **190** instructs television **110** to obtain television script **192** which has instructions to play television video **133** corresponding to the selected chapter, to interact with viewer **100**, and to overlay picture **143** over picture **141**.

In one embodiment, television script **192** replaces television script **190**. Television **110** uses television script **192** to process pictures **141** and **143**. In one embodiment, after television **110** finishes processing television script **192**, television

sion **110** resumes processing television script **190**. In one embodiment, video player **201** continues processing television video **131** while television **110** switches from television script **190** to television script **192**. Viewer **100** does not see any interruption of television video **131** played on picture **141**. In one embodiment, video player **203** continues processing television video **133** while television **110** switches from television script **190** to television script **192**. Viewer **100** does not see any interruption of television video **133** played on picture **143**.

In one embodiment, television **110** includes a timer **372**. Television **110** determines timer **372** expires, and obtains television script **192**. In one embodiment, pictures **141** and **143** are not interrupted when television **110** replaces television script **190** by television script **192**. In one embodiment, television **110** subscribes to a television service **374** and automatically obtains television script **192** from television service provider **174**.

In one embodiment, viewer **100** instructs television **110** to obtain television script **192**. In one embodiment, television **110** obtains television script **192** based on video player **201**. In one embodiment, television video **131** is television show of a football game. Video player **201** determines television video **131** is at half time of the football game. Video player **201** informs television **110** to obtain television script **192** with instructions to overlay television video **133** such as commentator interviews over television video **131**.

In one embodiment, television script **190** includes one or more instructions to place picture **141** onto a new position on display **113**. In one embodiment, television script **190** includes instructions to specify a path from the current position to the new position on display **113**. In one embodiment, the path is a 3-dimensional path wherein depth value **221** changes while picture **141** is moved from the current position to the new position. In one embodiment, television script **190** includes instructions to specify an operation of picture **141**. In one embodiment, the operation includes scaling the size of picture **141**. In one embodiment, the operation includes rotating picture **141**. In one embodiment, the rotation is based on 3-dimensional coordinates. In one embodiment, television script **190** includes instructions to repeat the operation of picture **141**.

The invention can take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment containing both hardware and software elements. In a preferred embodiment, the invention is implemented in software, which includes but is not limited to firmware, resident software, microcode, etc.

Furthermore, the invention can take the form of a computer program product accessible from a computer-usable or computer-readable medium providing program code for use by or in connection with a computer or any instruction execution system. For the purposes of this description, a computer-usable or computer readable medium can be any apparatus that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device.

The medium can be an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system (or apparatus or device) or a propagation medium. Examples of a computer-readable medium include a semiconductor or solid state memory, magnetic tape, a removable computer diskette, a random access memory (RAM), a read-only memory (ROM), a rigid magnetic disk and an optical disk. Current examples of optical disks include compact disk—read only memory (CD-ROM), compact disk—read/write (CD-R/W) and DVD.

A data processing system suitable for storing and/or executing program code will include at least one processor coupled directly or indirectly to memory elements through a system bus. The memory elements can include local memory employed during actual execution of the program code, bulk storage, and cache memories which provide temporary storage of at least some program code in order to reduce the number of times code must be retrieved from bulk storage during execution.

Input/output or I/O devices (including but no limited to keyboards, displays, point devices, etc.) can be coupled to the system either directly or through intervening I/O controllers.

Network adapters may also be coupled to the system to enable the data processing system to become coupled to other data processing systems or remote printers or storage devices through intervening private or public networks. Modems, cable modem and Ethernet cards are just a few of the currently available types of network adapters.

Although the present invention has been described in accordance with the embodiments shown, one of ordinary skill in the art will readily recognize that there could be variations to the embodiments and those variations would be within the spirit and scope of the present invention. Accordingly, many modifications may be made by one of ordinary skill in the art without departing from the spirit and scope of the appended claims.

What is claimed is:

1. A method for displaying videos on a television, comprising:

   (a) receiving a plurality of video signals directly from a plurality of video sources by the television;

   (b) receiving a first software script by the television over a data network, the first software script comprising first web programming instructions and second web programming instructions;

   (c) in executing the first web programming instructions by the television, placing a first picture from a first video signal of the plurality of video signals in a first position at a first depth value on a display coupled to the television;

   (d) in executing the second web programming instructions by the television, placing a second picture from a second video signal of the plurality of video signals in a second position at a second depth value on the display, and displaying the second picture overlaying on top of the first picture;

   (e) receiving a second software script by the television over the data network, the second software script comprising third web programming instructions; and

   (f) in executing the third web programming instructions by the television, moving the first picture to a new position on the display using animation as specified by the third web programming instructions, wherein the first depth value of the first picture changes while the first picture is being moved, wherein at the new position, the first picture is displayed overlaying on top of the second picture based on the changed first depth value.

2. The method of claim **1**, wherein the third web programming instructions further comprises a path from the first position to the new position for the first picture, wherein in executing the third web programming instructions, the first picture is moved to the new position along the path using the animation.

3. The method of claim **1**, wherein the first software script further comprises web programming instructions to obtain the second software script.

4. The method of claim **1**, wherein the first software script determines that the first video signal requires the second

software script, and the first software script instructs the television to obtain the second software script.

5. The method of claim **1**, wherein the television receives instructions from a viewer to obtain the second software script.

6. The method of claim **1**, wherein the second software script replaces the first software script.

7. The method of claim **1**, wherein after executing the third web programming instructions in the second software script, the television resumes the execution of the first and second web programming instructions in the first software script.

8. The method of claim **1**, wherein the first video signal comprises a description, wherein the television performs a video search on the plurality of video signals based on the description, wherein a result of the video search comprises the second video signal.

9. The method of claim **8**, wherein the first video signal further comprises an image, wherein the description is related to the image.

10. The method of claim **1**, wherein the receiving (b) comprises:

   (b1) receiving the first software script by the television from a television service provider.

11. The method of claim **1**, wherein the first, the second, and the third web programming instructions each comprise Javascript.

12. The method of claim **1**, wherein the moving (f) comprises:

   (f1) moving the first picture to the new position on the display using a 3-dimensional animation as specified by the third web programming instructions.

13. The method of claim **12**, wherein the 3-dimensional animation comprises one or more of the following: rotation; scaling; translation; and spinning.

14. The method of claim **1**, wherein the first picture comprises a size, wherein the moving (f) further comprises:

   (f1) changing the size of the first picture as the first picture is moving to the new position on the display using the animation as specified by the third web programming instructions.

15. The method of claim **1**, wherein the placing and displaying (d) comprises:

   (d1) displaying the second picture as overlaying translucently on top of the first picture, wherein the first picture is at least partially visible through the second picture in an overlaying area.

16. A television, comprising:

a plurality of interfaces for receiving a plurality of video signals directly from a plurality of video sources;

a first video player for processing a first video signal of the plurality of video signals;

a first video buffer for storing a first picture from the processed first video signal, the first video buffer being associated with a first depth value;

a second video player for processing a second video signal of the plurality of video signals;

a second video buffer for storing a second picture from the processed second video signal, the second video buffer being associated with a second depth value;

a local storage for storing a first software script received by the television over a data network, the first software script comprising first web programming instructions and second web programming instructions; and

an overlay processor for executing the first web programming instructions and the second web programming instructions,

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wherein in executing the first web programming instructions, the overlay processor places the first picture in a first position at the first depth value on a display coupled to the television,

wherein in executing the second web programming instructions, the overlay processor places the second picture at the second depth value on the display and displays the second picture overlaying on top of the first picture,

wherein the local storage further stores a second software script received by the television over the data network, the second software script comprising third web programming instructions, wherein the overlay processor further executes the third web programming instructions

wherein in executing the third web programming instructions, the overlay processor moves the first picture to a new position on the display using animation as specified by the third web programming instructions, wherein the first depth value of the first picture changes while the first picture is being moved, wherein at the new position, the first picture is displayed overlaying on top of the second picture based on the changed first depth value.

17. The television of claim 16, wherein the first video player and the second video player each comprises a video capable graphics processor.

18. The television of claim 17, wherein the first video buffer and the second video buffer each comprises video memory addressable by the corresponding video capable graphics processor.

19. The television of claim 16, wherein the first video signal comprises a description, wherein the television performs a video search on the plurality of video signals based on the description, wherein a result of the video search comprises the second video signal.

20. The television of claim 16, wherein the first software script is received by the television from a television service provider.

21. The television of claim 16, wherein the first, the second, and the third web programming instructions each comprise Javascript.

22. The television of claim 16, wherein in executing the third web programming instructions, the overlay processor further moves the first picture to the new position on the display using a 3-dimensional animation as specified by the third web programming instructions.

23. The television of claim 22, wherein the 3-dimensional animation comprises one or more of the following: rotation; scaling; translation; and spinning.

24. The television of claim 16, wherein the first picture comprises a size, wherein in executing the third web programming instructions, the overlay processor further changes the size of the first picture as the first picture is moving to the new position on the display using the animation as specified by the third web programming instructions.

25. The television of claim 16, wherein the placing and displaying of the first picture and second picture comprises:

displaying the second picture as overlaying translucently on top of the first picture, wherein the first picture is at least partially visible through the second picture in an overlaying area.

26. A non-transitory computer readable medium having computer readable code for processing video signals received by a television, the computer readable code configured to:

receive a plurality of video signals directly from a plurality of video sources by the television;

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receive a first software script by the television over a data network, the first software script comprising first web programming instructions and second web programming instructions;

in executing the first web programming instructions by the television, place a first picture from a first video signal of the plurality of video signals in a first position at a first depth value on a display coupled to the television;

in executing the second web programming instructions by the television, place a second picture from a second video signal of the plurality of video signals in a second position at a second depth value on the display, and display the second picture overlaying on top of the first picture;

receive a second software script by the television over the data network, the second software script comprising third web programming instructions; and

in executing the third web programming instructions by the television, move the first picture to a new position on the display using animation as specified by the third web programming instructions, wherein the first depth value of the first picture changes while the first picture is being moved, wherein at the new position, the first picture is displayed overlaying on top of the second picture based on the changed first depth value.

27. The medium of claim 26, wherein the third web programming instructions further comprises a path from the first position to the new position for the first picture, wherein in executing the third web programming instructions, the first picture is moved to the new position along the path using the animation.

28. The medium of claim 26, wherein the receive is further configured to:

receive the first software script from a television service provider.

29. The medium of claim 26, wherein the first, the second, and the third web programming instructions each comprise Javascript.

30. The medium of claim 26, wherein in executing the third web programming instructions, the first picture moves to the new position on the display using a 3-dimensional animation as specified by the third web programming instructions.

31. The medium of claim 30, wherein the 3-dimensional animation comprises one or more of the following: rotation; scaling; translation; and spinning.

32. The medium of claim 26, wherein the first picture comprises a size, in executing the third web programming instructions, the size of the first picture changes as the first picture is moving to the new position on the display using the animation as specified by the third web programming instructions.

33. A system, comprising:

a processor; and

a non-transitory computer readable medium having computer readable code for processing video signals, wherein when executed by the processor causes the system to:

receive a plurality of video signals directly from a plurality of video sources by a television;

receive a first software script by the television over a data network, the first software script comprising first web programming instructions and second web programming instructions;

in executing the first web programming instructions by the television, place a first picture from a first video

signal of the plurality of video signals in a first position at a first depth value on a display coupled to the television;

in executing the second web programming instructions by the television, place a second picture from a second video signal of the plurality of video signals in a second position at a second depth value on the display, and display the second picture overlaying on top of the first picture;

receive a second software script by the television over the data network, the second software script comprising third web programming instructions; and

in executing the third web programming instructions by the television, move the first picture to a new position on the display using animation as specified by the third web programming instructions, wherein the first depth value of the first picture changes while the first picture is being moved, wherein at the new position, the first picture is displayed overlaying on top of the second picture based on the changed first depth value.

34. The system of claim **33**, wherein the system receives the first software script from a television service provider.

35. The system of claim **33**, wherein the first, the second, and the third web programming instructions each comprise Javascript.

36. The system of claim **33**, wherein in executing the third web programming instructions, the first picture moves to the new position on the display using a 3-dimensional animation as specified by the third web programming instructions.

37. The system of claim **36**, wherein the 3-dimensional animation comprises one or more of the following: rotation; scaling; translation; and spinning.

38. The system of claim **33**, wherein the first picture comprises a size, in executing the third web programming instructions, the size of the first picture changes as the first picture is moving to the new position on the display using the animation as specified by the third web programming instructions.

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