

SYSTEM AND METHOD FOR AN INTERACTIVE COMIC STRIP

FIELD OF THE INVENTION

The present invention relates to the field of comic strips. More particularly, it relates to a system and method for digitally providing an interactive comic strip.

BACKGROUND OF THE INVENTION

A comic strip generally refers to a sequence of drawings arranged in interrelated panels to display brief humour or to form a narrative, often serialized, with text in speech bubbles/balloons and captions. Such a comic strip is commonly found in newspapers and magazines. The origins of the comic strip could be traced as far back as 1896 where sequences of drawings have been attached to each other for telling stories. Thereafter, the first physical copy of a traditional comic book consisting of several comic strips compiled into a single narrative was first published in 1933. Currently hundreds of different comic books exist throughout the world.

As technology developed, comic strips have been digitised and distributed as digital files (i.e. PDFs / Digital Image Files) through the internet. More recently, comic strips have been made available on the computer and on portable devices through web based applications and eBooks. In addition, comic strips have also been made available for downloading in an electronic form to an individual's computer, smartphone or digital display. However, the delivery mechanism of the comic strip has yet to evolve from its original form where the comic strip remains static with predefined images and storylines.

While the manner by which comic strips are distributed and disseminated has improved, the manner by which comic strips are displayed has largely remained the same. Comic strips typically have a static display. This means that the graphical and the textual components of the comic strips are displayed page by page and cannot be changed, similar to the traditional

newspaper. Even where comic strips are distributed through digital channels, the digital files are usually downloaded and displayed to the user as a single graphic file.

In some cases, the digital files may separate the text information of the comic strip from the graphic information of the comic strip and put them into different layers so as to display comic strips in a dynamic manner.

Reference is made to US patent no. 8643667B2 which allows for a dynamic display of comic strips in the digital space. The technology referred to employs the use of the video capabilities of the computer, smartphone or digital display that the comic strip is downloaded onto and allows the user to magnify the text image which has been embedded onto the comic strip as a separate layer on top of the underlying graphic image, without altering the underlying graphic image which remains static. Even then, such a dynamic display does not grant the user any control over the content of the graphic information in the comic strip. There are basic mechanical commands such as starting, stopping, and pausing, but these controls do not alter the graphic information that is part of the comic strip.

Reference is made to US patent no. 8621366B1 wherein communications to be shared on social networks and other electronic modes of communication are presented in comic strip form. The said patent allows the end user to enter their own title and text to a pre-defined comic strip but the end product remains static. Thus, said patent does not allow for the dynamic alteration of the underlying graphic information.

Accordingly, it is an object of the present invention to provide a comic strip which provides a customised graphical appearance for the user.

SUMMARY OF THE INVENTION

In a broad form, the present invention provides a system and method for digitally providing an interactive comic strip.

According to one aspect of the invention, the present invention discloses a method of electronically providing an interactive comic strip, the method comprising:

- Providing a comic strip framework with predetermined locations for an insertion of facial images, each location having a predetermined emotional value;

- Providing an interface for a user to select from a set of initial facial images, each initial facial image to be associated with a corresponding emotional value, so that a set of facial image is produced, each corresponding to a different emotional value;

- Upon selection of the interactive comic strip, automatically inserting the corresponding selected facial images into the interactive comic strip at the predetermined locations, wherein the facial images selected are associated with the emotional values which have been predetermined for that location, so that the interactive comic strip thereby includes facial images which have been selected by the user.

According to another aspect of the invention, each initial facial image is processed by the removal of background and hair. According to another aspect of the invention, each initial image is processed by altering the look and feel of the initial image to meet predetermined criteria consistent with the appearance of the comic strip.

According to another aspect of the invention, a hairstyle is selected and placed over each initial facial image.

According to another aspect of the invention, the set of facial images is placed or referenced in a table which includes the required tilt and other modifications required for each facial image, specific to the corresponding each emotional value.

According to another aspect of the invention, a facility is provided for the user to provide the initial facial images using the camera function of a smart device.

According to another aspect of the invention, the initial facial images are provided from stored images.

For the purposes of this application, “emotional value” refers to the various emotions that may be experienced and displayed by facial expressions, examples of which are happiness, sadness, and anger. However, it will be understood that any emotion which could be expressed via facial expressions could have a corresponding emotional value and be represented according to the present invention.

According to another aspect of the invention, a plurality of facial images across a plurality of emotional values are inserted and displayed in the interactive comic strip in accordance with the information provided by an emotional framing index which lists the predetermined locations within the comic strip framework for the insertion of facial images, each location having a predetermined emotional value, as well as the necessary scale and tilt that has to be applied to the applicable facial image to be inserted.

According to another aspect of the invention, an image manipulation algorithm processes the series of images provided by the user by first separating the facial image from its background, making a halftone of the facial image and thereafter applying a custom art filter to the facial image such that the facial image has the look and feel of an illustrated cartoon face suited for the interactive comic strip’s look and feel.

The accumulation of the above features accordingly gives the user the interactive comic strip experience whereby the storyline includes the facial images of characters whose appearance is determined by the user’s choice.

BRIEF DESCRIPTION OF THE DRAWINGS

Illustrative embodiments of the present invention will now be described with reference to the accompanying figures, in which:

Figure 1: a flowchart illustrating one implementation of the present invention.

Figure 2: a flowchart showing an example of a process by which a user takes the facial images that are to be incorporated into an interactive comic strip by using a camera that is built onto the smart device.

Figure 3: shows an appearance of a Selfiecamera Screen.

Figure 4: a flowchart showing an example of the process by which the App processes the facial image.

Figure 5: shows an appearance of a Hairstyle Selection Screen.

Figure 6: shows an example of how facial images are taken with specified emotions depicted
5 in those facial images at the Selfiecamera Screen.

Figure 7: shows an example of how a user choses and places an illustrated hairstyle over the processed facial image.

Figure 8: shows an example of how a user associates a Saved Gallery Image(s) with various emotional value(s) provided in the App's Emotion Association Section provided in an
10 Emotional Selector Screen.

Figure 9: shows an example of how a user selects an interactive comic strip from a Comic Library Screen.

Figure 10: shows the Emotional Framing Index.

Figure 11: a flowchart showing an Image Insertion Process.

Figure 12: shows an appearance of the interactive comic strip with the predetermined
15 locations filled with an EV Associated Image(s) in accordance with the information provided in the Emotional Framing Index.

Figure 13: illustrates an example of puzzles and codes faced by a user that affects the user's progression through the interactive comic strip's storyline.

Figure 14: illustrates another example of the puzzles and codes faced by a user that affects
20 the user's progression through the interactive comic strip's storyline.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A preferred embodiment of the invention will now be described in detail. It will be
25 appreciated that this is intended to be illustrative of the invention, and is not limitative thereof. It is envisaged that alternative implementations of the invention are possible, depending upon the details of features, interfaces and so forth desired by a designer.

This invention will be described with reference to an application hereinafter referred to as
30 the "App" that can be downloaded onto a suitable device. This may be a computer, smartphone, tablet, online facility or digital display hereinafter collectively referred to as a

“smart device”. However, it will be understood that the invention could be provided as a stand-alone software product, for example for a PC or other computer, as an on-line feature, for example on a website, or in any other suitable way.

- 5 For the avoidance of doubt, an application is only one embodiment of the invention and the invention may be embodied in other forms.

The App allows for an interactive comic strip, in which the facial images taken or chosen by the user are incorporated into the graphical content of the interactive comic strip, so that
10 a unique experience is provided to the user. It will be appreciated that this approach may be applied to either new or pre-existing comic strips.

Referring to Figure 1, an overview of one implementation of the present invention will now be described.

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Launch of App

A splash screen 100 is first displayed upon the launching of the App on a smart device. Thereafter, the user is brought to the “Home Screen 101” automatically. From the Home Screen 101, the user can access one of five pages being the “Instruction Screen 102”, the
20 “Selfiecamera Screen 103”, the “Emotional Selector Screen 104”, the “Comic Library Screen 105” or the “About Screen 106”.

The Instruction Screen 102 is where a guide on how the App can be accessed and used by the user is displayed. The Selfiecamera Screen 103 is where a user takes the facial images
25 107 that are to be incorporated into the interactive comic strip 115. The Emotional Selector Screen 104 is where the facial images taken are associated with the various emotional values 112. The Comic Library Screen 105 is where a user selects 113 an interactive comic strip 115 to read. The About Screen 106 is where the legal terms and conditions are displayed.

Selfiecamera Screen

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A user takes the facial images 107 that are to be incorporated into an interactive comic strip 115 at the Selfiecamera Screen 103 by using the camera that is built onto the smart device. A flowchart showing an example of a process by which a user takes the facial images 107 that are to be incorporated into an interactive comic strip 115 at by using the camera that is built onto the smart device is set out in Figure 2. A screen capture of the Selfiecamera Screen 103 is set out in Figure 3.

Once the facial images have been taken, the App automatically processes the facial image 108. A flowchart showing an example of the process by which the App processes the facial image is set out in Figure 4.

Hairstyle Selection Screen

After the App has processed the facial image, the user is brought to the “Hairstyle Selection Screen 109”. At the Hairstyle Selection Screen 109, the user can chose from a range of illustrated hairstyles for placement over the processed facial image 110. A screen capture of a Hairstyle Selection Screen 109 is set out in Figure 5. An example of how the processed facial images with specified emotions depicted appears at a Hairstyle Selection Screen is set out in Figure 6. An example of how a user choses and places the illustrated hairstyle over the processed facial image 110 is set out in Figure 7. Once the user has chosen and placed the illustrated hairstyle over the processed facial image, such finalised facial image is then saved 111 onto the App’s “Image Gallery” as a “Saved Gallery Images” so that they can be later incorporated into the interactive comic strip.

Emotional Selector Screen

The Emotional Selector Screen 104 consists of the Image Gallery and the “Emotion Association Section”. The Emotion Association Section is provided with a range of emotional values.

A user selects the Saved Gallery Image(s) for association with the emotional value(s) provided in the Emotion Association Section. The Saved Gallery Image that has been associated with any of the emotional values provided in the Emotion Association Section is

an “EV Associated Image”. Such EV Associated Image takes the form of an image file (for example in the .png format) with a predetermined size.

An example of how a user associates the selected Saved Gallery Image(s) with the various emotional value(s) in the App’s Emotion Association Section is set out in Figure 8.

If a user (for example a second or subsequent time user) already has pre-existing Saved Gallery Images, the user can utilise these image(s) and proceed directly to the Emotional Selector Screen 104.

Comic Library Screen

A user selects 113 an interactive comic strip 115 to read from the Comic Library Screen 105. An example of how a user selects 113 an interactive comic strip 115 to read from the Comic Library Screen 105 is set out in Figure 9.

Each interactive comic strip 115 is provided with a comic strip framework with predetermined locations for the insertion of the facial images, each location having a predetermined emotional value.

Each interactive comic strip 115 is provided with the “Emotional Framing Index”. Such Emotional Framing Index comprises a list of the predetermined locations within the comic strip framework for the insertion of EV Associated Image(s), each location having a predetermined emotional value as well as the necessary scale and tilt that has to be applied to the applicable EV Associated Image to be inserted. An example of the Emotional Framing Index is set out in Figure 10.

The EV Associated Image(s) will be automatically inserted (“Image Insertion Process 114”) into the interactive comic strips 115 at the pre-determined locations, each location having a predetermined emotional value in accordance with the Emotional Framing Index. This Image Insertion Process 114 is provided to occur automatically and is completed prior to the display of the interactive comic strip 115. A flowchart showing the Image Insertion Process

114 by which the EV Associated Image(s) are automatically inserted into the Interactive Comic Strip 115 is set out in Figure 11.

If a user (for example a second or subsequent time user) already has pre-existing EV Associated Image(s), the user may proceed directly to the Comic Library Screen 105.

The result of the Image Insertion Process 114 is that the pre-determined locations would be filled with the EV Associated Image(s) in accordance with the information provided in the Emotional Framing Index.

The process set out in Figure 1 occurs whenever a user uses the App to access an interactive comic strip 115. It applies similarly to a plurality of emotions and to a plurality of designated characters.

Figure 2 consists of a flowchart showing an example of a process by which, in an implementation of the present invention, a user takes the facial images 107 that are to be incorporated into an interactive comic strip 115 by using the camera that is built onto the smart device.

At the Selfiecamera Screen 103, the user is given instructions as to how the facial image should be taken. Such instructions includes instructions to take the facial images with specified emotions (for example neutral, happiness, sadness, anger) depicted in those facial images. Once the facial image is taken 107A, such facial image is displayed to the user 107B and the user is provided with the option of whether he wishes to retake the facial image 107C or to save such image.

If the user opts to retake the facial image, he will be brought to the Selfiecamera Screen 103 again to repeat the process.

If the user opts to save the facial image, such facial image is processed 108 in accordance with the processes described herein, the illustrated hairstyle is chosen and placed over the

processed facial image 110 and it is then saved onto the Image Gallery as a Saved Gallery Image.

Figure 3 describes, in an implementation of the present invention, the appearance of the Selfiecamera Screen 103.

Figure 4 consists of a flowchart showing an example of the process by which, in an implementation of the present invention, the App processes the facial image.

In this example, the processing of the saved facial image is carried out in two stages.

First Stage

The background and hair of the saved facial image is removed at the first stage.

Appropriate examples of software that may be used for the purposes of the first stage are set out herein. The App may use the *CI Detector* (<https://developer.apple.com/documentation/coreimage/cidetector>) to recognise the facial image saved by the user 201 at the Selfiecamera Screen 103. The App may then use *Dlib Frontal Face Detector* (http://dlib.net/face_detector.py.html) to detect the facial part points (i.e. eyes, jawline and nose etc) of the saved facial image 202 and a mask image will be created from the detected facial parts 203 based on four variants of face height and width.

Open CV (<https://opencv.org/about.html>) will then be used to separate the areas of the facial image 204 with the said mask image created above from the background of the facial image.

The separated area is then resized 205 to fit the dimensions of the original facial image.

A second mask image is then created over the resized facial image using *Open CV* 206. *Open CV* is then used to separate the areas of the resized facial image 207 from the second mask image created above from the rest of the resized facial image.

A third mask is then created 208 from the second separated facial image 207. The App then separates the facial image 209 based on the third mask image and the jawline detected making a background-removed facial image using *Open CV*.

5 Second Stage

After the background and hair are removed from the facial image, the image undergoes further processing to alter the look and feel of the background removed facial image.

At this stage, the App makes a halftone of the background-removed facial image using
10 *GPUImage* ([https://github.com/BradLarson /GPUImage](https://github.com/BradLarson/GPUImage)) 210 such that the background-removed facial image has the look and feel of an illustrated cartoon face.

Thereafter, the *GPUImage* applies a custom art filter 211 to the halftone facial image such that the halftone facial image fits the interactive comic strip's aesthetic including its
15 illustration style and colour palette.

After the App has processed the facial image, the user is brought to the Hairstyle Selection Screen 109.

20 Figure 5 describes, in an implementation of the present invention, the appearance of a Hairstyle Selection Screen 109.

Figure 6 shows an example of how, in an implementation of the present invention, the processed facial images with specified emotions depicted appears at the Hairstyle Selection
25 Screen. The specified emotions can include neutral 109A, happiness 109B or anger 109C.

Figure 7 shows an example of how, in an implementation of the present invention, a user chooses and places the illustrated hairstyle over the processed facial image 110.

30 At the Hairstyle Selection Screen 109, the processed facial image is displayed alongside a hairstyle gallery where a range of illustrated hairstyles is displayed.

A user chooses the illustrated hairstyle to be placed over the processed facial image by pressing on the selected illustrated hairstyle in the hairstyle gallery. Thereafter the selected illustrated hairstyle will appear over the processed facial image.

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A user may now adjust the placement of the selected illustrated hairstyle using *Vision Framework* (<https://developer.apple.com/documentation/vision>). The placement of the selected illustrated hairstyle is adjusted through adjustments to the size of the selected illustrated hairstyle and adjustments to the position of the selected illustrated hairstyle.

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The size of the selected illustrated hairstyle is adjusted to be smaller by placing two fingers on the illustrated hairstyle and drawing the fingers closer to each other without lifting those fingers off from the illustrated hairstyle 301. Similarly, the size of the selected illustrated hairstyle is adjusted to be bigger by placing two fingers on the illustrated hairstyle and moving the fingers further away from each other without lifting those fingers off from the illustrated hairstyle 302. The position of the selected illustrated hairstyle is adjusted when the selected illustrated hairstyle is pressed on with a finger and pushed without lifting that finger off from the illustrated hairstyle 303, 304. Once the user is satisfied with their adjustments made to the processed facial image, the user presses a button to accept the choice and placement of the illustrated hairstyle over the processed facial image, making it a finalised facial image which is then saved 111 as a Saved Gallery Image(s).

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Figure 8 shows an example of how, in an implementation of the present invention, a user associates the Saved Gallery Image(s) with the various emotional value(s) provided in the App's Emotion Association Section.

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The Emotional Selector Screen 104 consists of an Image Gallery and an Emotion Association Section. A plurality of Saved Gallery Images is displayed in the Image Gallery. Under the Emotion Association Section, a plurality of buttons with a space accompanying each of those buttons are displayed. Each of these buttons are labelled according to the various emotional values in the interactive comic strip's Emotional Framing Index

indicating that the applicable buttons are associated with the applicable emotional values in the interactive comic strip's Emotional Framing Index. The spaces accompanying each of those buttons are where the Saved Gallery Images that have been associated with the applicable emotional values in the Emotion Association Section are displayed once such association 112 has taken place.

To associate the Saved Gallery Image with the various emotional values in the App's Emotion Association Section, a user is required to press on any one of the buttons in the Emotion Association Section 401. Once such a button has been pressed, the Emotion Association Section will appear as greyed out 402. Thereafter the user has to press on any one of the Saved Gallery Images displayed in the Selfie Gallery. Once any of the Saved Gallery Images displayed in the Selfie Gallery is pressed on, the Emotion Association Section will reappear in colour and the applicable Saved Gallery Image pressed on would appear in the space accompanying the applicable button pressed on by the user earlier indicating that the applicable emotional value in the App's Emotion Association Section associated with the applicable button pressed on by the user earlier has been successfully associated with the applicable Saved Gallery Image 403.

Figure 9 describes an example of how, in an implementation of the present invention, a user selects an interactive comic strip 115 to read from the Comic Library Screen 105.

There are various ways in which interactive comic strips 115 are displayed on the Comic Library Screen 105. The Comic Library Screen 105 can display interactive comic strips 115 with its cover in colour to the user, indicating that it has been made available and that it can be selected. Such interactive comic strips 115 can also be displayed with an added blue border around its cover, indicating that it has been purchased by the user. The Comic Library Screen 105 can also display interactive comic strips with its cover greyed out, indicating that it has yet to be purchased by the user and that they cannot be selected at the moment. Lastly, the Comic Library Screen 105 can also display interactive comic strips 115 behind a yellow banding, indicating that it has yet to be released and made available to the user for purchase and that they cannot be selected at the moment.

At the Comic Library Screen 105, the user selects an interactive comic strips 115 to read by pressing on an interactive comic strips with its cover displayed in colour.

5 Figure 10 describes, in an implementation of the present invention, the Emotional Framing Index.

Figure 11 consists of a flowchart showing the Image Insertion Process 114, in an implementation of the present invention.

10 When the user selects the interactive comic strip 115, the App will load the comic strip and the Image Insertion Process 114 will occur. In this process, the App will automatically access the information provided in the Emotional Framing Index of the interactive comic strips 501 and insert the EV Associated Image(s) into the interactive comic strip 115 at the applicable
15 predetermined locations within the comic strip framework provided for the insertion of EV Associated Image(s), each location having a predetermined emotional value 502. Thereafter, the necessary scale and tilt will be applied to the EV Associated Image(s) in accordance with the information recorded in the Emotional Framing Index 503. This Image Insertion Process 114 will be completed prior to the display of the interactive comic strip 115.

20 Figure 12 describes, in an implementation of the present invention, an example of an interactive comic strip 115 with the predetermined locations filled with the EV Associated Image(s) in accordance with the information provided in the Emotional Framing Index.

25 Figure 13 describes, in an implementation of the present invention, an example of the puzzles and codes faced by a user 601 that affects the user's progression through the interactive comic strip's storyline.

30 Figure 14 describes, in an implementation of the present invention, another example of the puzzles and codes faced by a user 602 that affects the user's progression through the interactive comic strip's storyline.

Whilst the present invention has been described in the context of a single character having the facial image of a user inserted in response to a predetermined emotional value, it should
5 be understood that this is only one implementation. For example, the framework may allow for two or more characters to be similarly substituted, so that a user and their friend (for example) can appear in the comic strip. In some implementations, options may be provided so that the user selected which character they are to be substituted for, which may be achieved by providing alternative comic strip frameworks for selection by the user.

10 The above described embodiments are given as illustrative examples only. It will be readily appreciated that many deviations may be made from the specific embodiments disclosed in this specification without departing from the invention. Accordingly, the scope of the invention is to be determined by the claims below rather than being limited to the specifically
15 described embodiments above.

CLAIMS:

1. A method of electronically providing an interactive comic strip, the method comprising:

5 - Providing a comic strip framework with predetermined locations for an insertion of facial images, each location having a predetermined emotional value;

 - Providing an interface for a user to select from a set of initial facial images, each initial facial image to be associated with a corresponding emotional value, so that a set of facial images is produced, each corresponding to a different emotional value;

10 - Upon selection of the interactive comic strip, automatically inserting the corresponding selected facial images into the interactive comic strip at the predetermined locations, wherein the facial images selected are associated with the emotional values which have been predetermined for that location, so that the interactive comic strip thereby includes facial images which have been selected by the user.

15 2. The method of claim 1, wherein each initial facial image is processed by the removal of background and hair.

20 3. The method of claim 2, wherein each initial image is processed by altering the look and feel of the initial image to meet predetermined criteria consistent with the appearance of the comic strip.

 4. The method of claim 3, wherein a hairstyle is selected and placed over each initial facial image.

25 5. The method of claim 4, wherein the set of facial images is placed or referenced in a table which includes the required tilt and other modifications required for each facial image, specific to the corresponding each emotional value.

30 6. The method of claim 1, wherein a facility is provided for the user to provide the initial facial images using the camera function of a smart device.

7. The method of claim 1, wherein the initial facial images are provided from stored images.