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22830
CARR & FERRELL LLP
120 CONSTITUTION DRIVE
MENLO PARK, CA 94025

CONFIRMATION NO. 3714
FILING RECEIPT



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Date Mailed: 06/07/2016

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 62/340,110**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Media Tags Location-Anchored Digital Media for Augmented Reality and Virtual Reality Environments

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Inventor(s)					
Inventor 1					Remove
Given Name	Middle Name	Family Name	City	State	Country j
Paul	Simon	Martin	Sydney		AU
All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the Add button.					Add
Title of Invention		Media Tags Location-Anchored Digital Media for Augmented Reality and Virtual Reality Environments			
Attorney Docket Number (if applicable)		PA7415PRV			
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Customer Number			22830		

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☒ No.

Yes, the invention was made by an agency of the United States Government. The U.S. Government agency name is:

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Entity Status**Applicant asserts small entity status under 37 CFR 1.27 or applicant certifies micro entity status under 37 CFR 1.29**

- ☒ Applicant asserts small entity status under 37 CFR 1.27
- ☐ Applicant certifies micro entity status under 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
- ☐ No

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Signature	K. Brian Bathurst/		Date (YYYY-MM-DD)	2016-05-23	
First Name	K. Brian	Last Name	Bathurst	Registration Number (If appropriate)	51442

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**MEDIA TAGS – LOCATION-ANCHORED DIGITAL MEDIA FOR AUGMENTED
REALITY AND VIRTUAL REALITY ENVIRONMENTS**

INVENTOR:

5 Paul Simon Martin, Sydney, Australia

FIELD OF THE TECHNOLOGY

[0001] Embodiments of the disclosure relate to augmented reality and virtual reality
10 environments.

BRIEF SUMMARY OF THE INVENTION

[0002] A method for attaching media content ("Media Tags") to both coarse-grain
and fine-grain real-world locations, via augmented reality, and to locations in virtual
reality environments such that they may be both authored and viewed contextually
15 similar to physically-placed content in real life.

[0003] The media may also have Social context, which means an associated user
profile or mentions other users. It may be either created and shared anew by users or
viewed by others based on the authors' sharing settings and the viewers' filtering
settings.

20 [0004] Data associated with the media content persists in the form of combinations of:
image, text, audio and movie data that is stored on a remote server and also optionally
cached locally on the user device storage.

[0005] Visibility of previously-created AR Media Tags is based on various filtering
techniques including:

25 [0006] Proximity to the user;

[0007] Settings chosen by the author of each Tag (e.g. public, friends, friends-of-
friends);

[0008] Settings chosen by the viewer (e.g. All, friends, friends-of-friends); and

[0009] For visual clarity, Tags that are spatially close to each other may be grouped
30 together such that multiple user content can be associated with a single Tag. Users can
switch between the content by way of UI elements.

[0010] Media Tags that are created by a user will be immediately viewable by other users that are in proximity to their real-world locations.

[0011] Media Tags will be perspective-distorted such that tags that are closer to a viewer appear larger than those that are further away. By extension, if a user places a Media Tag in front of them, a remote viewer that is further away but still in eyesight of that user will see that Media Tag appear near the location of its creator, however the size of that Media Tag will be adjusted based on its relative distance from the user. If the creator is far from the viewer, the Media Tag will appear smaller than if the creator is close to the viewer.

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BRIEF DESCRIPTION OF THE DRAWINGS

[0001] While this technology is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail several specific embodiments with the understanding that the present disclosure is to be considered as an exemplification of the principles of the technology and is not intended to limit the technology to the embodiments illustrated.

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[0002] It will be understood that like or analogous elements and/or components, referred to herein, may be identified throughout the drawings with like reference characters. It will be further understood that several of the figures are merely schematic representations of the present technology. As such, some of the components may have been distorted from their actual scale for pictorial clarity.

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[0003] FIG. 1 shows an exemplary embodiment of a text tag.

[0004] FIG. 2 shows an exemplary embodiment of an image tag.

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[0005] FIG. 3 shows an exemplary embodiment of a movie tag.

[0006] FIG. 4 shows an exemplary embodiment of an audio tag.

[0007] FIG. 5 shows an exemplary embodiment of a social media tag in an augmented real world environment.

[0008] FIG. 6 shows an exemplary embodiment of a social media tag in a computer

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graphics virtual world environment.

[0009] FIG. 7 shows an exemplary embodiment of a social media tag in a single frame or multiple frames in a 360 degree spherical image virtual world environment.

[0010] FIG. 8 shows an exemplary embodiment of coordinate spaces.

[0011] FIG. 9 shows an exemplary placement model.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0012] In the following description, for purposes of explanation, numerous specific details are set forth to provide a thorough understanding of the disclosure. It will be
5 apparent, however, to one skilled in the art, that the disclosure may be practiced without these specific details.

[0013] Referring to FIG. 5, digital media traditionally does not allow users to associate fine-grain contextual locations for that content. For example, if we post a photo or movie to current social media websites, the best granularity for location that we
10 currently have is to add a textual location such as "...at ABC Cinemas", or "Jo's Grill". Instead users should have a mechanism to allow them to set a specific fine-grain location for that content such as "...1 meter to the right of the main door outside ABC Cinema" or "...at table #4 in Jo's Grill". In addition, if potential viewer of a user's content happens to be in proximity to the location of where it was posted, they should be able to visualize
15 that content *in situ*. For example, if they are walking past ABC Cinema, they should be able to see a photo or movie post that appears 1 meter to the right of the main door by way of an augmented reality interface.

[0014] Referring to FIGS. 6-7, we then take these examples and extend them to a virtual reality environment whereby the locations that can be associated with user
20 content are not real, but virtual. In these cases, authors of the content can "attach" their media to fine-grain virtual locations and viewers of that content can view it in the same location as the author intended by way of a virtual reality interface.

[0015] Media Tags contain the following properties:

[0016] Frame: Frames are the outer-most container for other features

25 [0017] Avatar badges: Optional. 1-n badges may be displayed and are attached to the Frame. Badges may be grouped to conserve screen space and to avoid obfuscation.

[0018] Title Panel: A text field. Displays an appropriate title for the content or for Social tags, this may be the author's social username or handle.

30 [0019] Media Panel: A mixed-media panel. Displays the main media content which may be, but not limited to, combinations of: images, text, sound samples, videos.

- [0020] Comments Panel: A text field. An additional area for the display of text. May be used for comments, short descriptions, Social mentions, etc.
- [0021] Text fields of Media Tags include several features besides from plain text, including: HTML, social hashtags using (but not limited to) “#” notation and social
5 mentions using (but not limited to) “@” notation.
- [0022] Implementation is broken into 4 parts:
- [0023] Authoring: Creation of media plus optional inclusion of Social media features.
- [0024] Placement & attachment: Allowing the user to place the authored content in a precise location in either a virtual-reality environment or in the real world by way of an
10 augmented-reality interface and the underlying data model that associates the content with a fine-grain attachment location.
- [0025] Storage: Storing the data that backs the authored content to persistent storage devices such as remote servers (aka “Cloud”).
- [0026] Viewing: Allowing potential viewers of the authored content to see that
15 content in either a virtual reality environment or in the real world by way of an augmented-reality interface.
- [0027] A pre-existing augmented reality or virtual reality platform comprises:
- [0028] An augmented reality platform creates a virtual graphics coordinate space that coincides with the real-world space around a user and renders computer graphics
20 relative to that virtual graphics coordinate system such that those graphics appear to exist in the real world. An appropriate viewing device is also assumed for the user, such as but not limited to; head-mounted display (e.g. augmented reality glasses or goggles), smartphone (i.e. acting as a viewing portal that displays computer graphics on top of, or blended with, a live video feed of the world as seen by camera hardware embedded in
25 the device).
- [0029] A virtual reality platform creates a virtual graphics coordinate space into which computer graphic content is rendered in such a way that when viewed through a viewing device, all the user sees is computer graphics. No real world objects are seen in this environment. Appropriate viewing and interaction devices are also assumed for the
30 user, such as but not limited to; head-mounted displays, optionally with body or body-part motion tracking sensors and software, smartphones (i.e. acting as a viewing portal

that displays computer graphics on top of, or blended with, a computer graphics environment background.

5 **[0030]** Authoring is achieved through a set of user interfaces which first allow the user to create or select the type of media they wish to place. For example, but not limited to: text, images, videos, audio or combinations thereof.

10 **[0031]** Referring to FIG. 9, placement & attachment: content is placed by allowing the user to first orient (rotate) the device relative in the graphics world coordinate space (which coincides with real space for augmented reality environments), then interactively set a placement distance ahead of them, in that orientation. Placement may be achieved in a variety of ways including the methods as described by co-pending U.S. Provisional Patent Application titled "Fine-Grain Placement and Viewing of Virtual Objects in Wide-Area Augmented Reality Environments."

15 **[0032]** Once that user has finished creating and placing a Media Tag, an "OnCreated" software event is triggered which causes the data associated with that Media Tag to be stored in a remote database server.

[0033] A storage data model that encapsulates the required properties to successfully store and load Media Tags may include:

[0034] GeoCoordinate:

[0035] 3-component vector of double-precision floating point numbers;

20 **[0036]** Latitude, Longitude, Altitude; and

[0037] The real-world reference location of the origin of the Media Tag.

[0038] WorldOffset:

[0039] 3-component vector of single-precision floating point numbers;

[0040] X, Y, Z; and

25 **[0041]** A graphics-space vector offset of the Media Tag from the reference origin.

[0042] WorldOrientation:

[0043] 3-component vector of single-precision floating point numbers;

[0044] Media Content:

[0045] Compressed Image, Video, Audio data

- [0046] A long integer that uniquely identifies the content and is supplied by the remote storage server
- [0047] Text Content:
- [0048] HTML-encoded text string
- 5 [0049] The data that is associated with the text regions of the Media Tag
- [0050] Creation Date:
- [0051] An integer timestamp
- [0052] Describes the initial creation date and time of the Media Tag
- [0053] Modification Date:
- 10 [0054] An integer timestamp
- [0055] Describes the last date and time that the Media Tag was modified
- [0056] X, Y, Z; and
- [0057] A graphics-space rotation of the Media Tag
- [0058] Author:
- 15 [0059] An optional record for the user that created the Media Tag;
- [0060] May include: user ID, username, URL to user's avatar image.
- [0061] This storage model will have instances that are created both in the runtime client platform and on the remote server. These models are kept synchronised via messages shared between client and server any time a modification event occurs, for
- 20 example when the user places a new Media Tag or modifies an existing one.
- [0062] An implementation for viewing Media Tags may include the following properties:
- [0063] The creator of Media Tags (Creators) will see those tags appear at the creation location in the augmented reality environment as intended by the user.
- 25 [0064] Other users (Viewers) will see Media Tags appear in their augmented reality environment at the same time as they are created by Creators, as long as they are within a reasonable physical viewing distance of them in the real world.
- [0065] As Media Tags are created by Creators, notification messages are sent to all other users (Viewers) that are in proximity to them. These notification messages cause
- 30 each viewer to receive the Media Tag data and have it displayed in a corresponding location, orientation and size relative to those viewers.