

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner,

v.

AUTONOMOUS DEVICES, LLC
Patent Owner

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,607,134**

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b.	[19.2] means for generating or receiving a second one or more object representations, wherein the second one or more object representations represent one or more objects of the application;	52
c.	[19.3] means for determining the first one or more instruction sets for operating the first avatar of the application based on at least partial match between the second one or more object representations and the first one or more object representations; and	53
d.	[19.4] means for executing, at least in response to the determining, the first one or more instruction sets for operating the first avatar of the application, wherein the first avatar of the application or a second avatar of the application performs one or more operations defined by the first one or more instruction sets for operating the first avatar of the application.....	54
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b.	[1.2] and one or more non-transitory machine readable media storing machine readable code that, when executed by the one or more processors, causes the one or more processors to perform at least:	55
c.	[1.3] accessing a first correlation including a first one or more object representations correlated with a first one or more instruction sets for operating a first avatar of an application, wherein the first one or more object representations represent one or more objects of the application;.....	56
d.	[1.4] generating or receiving a second one or more object representations, wherein the second one or more object representations represent one or more objects of the application;.....	57
e.	[1.5] determining the first one or more instruction sets for operating the first avatar of the application based on at least partial match between the second one or more object representations and the first one or more object representations; and.....	58

- f. [1.6] at least in response to the determining, causing the first avatar of the application or a second avatar of the application to perform one or more operations defined by the first one or more instruction sets for operating the first avatar of the application at least by executing the first one or more instruction sets for operating the first avatar of the application. 59
- 2. Claim 3 61
 - a. [3.1] The system of claim 1, wherein the determining the first one or more instruction sets for operating the first avatar of the application based on the at least partial match between the second one or more object representations and the first one or more object representations includes: 61
 - b. [3.2] determining that a number of at least partially matching portions of the second one or more object representations and portions of the first one or more object representations exceeds a threshold number, or determining that a percentage of at least partially matching portions of the second one or more object representations and portions of the first one or more object representations exceeds a threshold percentage. 61
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 - a. [17.1] The system of claim 1, wherein the machine readable code, when executed by the one or more processors, causes the one or more processors to further perform at least: modifying: the first one or more instruction sets for operating the first avatar of the application, or a copy of the first one or more instruction sets for operating the first avatar of the application, and.....62
 - b. [17.2] wherein the executing the first one or more instruction sets for operating the first avatar of the application includes executing: the modified the

first one or more instruction sets for operating the first avatar of the application, or the modified the copy of the first one or more instruction sets for operating the first avatar of the application, and 63

- c. [17.3] wherein the performing, by the first avatar of the application or by the second avatar of the application, the one or more operations defined by the first one or more instruction sets for operating the first avatar of the application includes performing, by the first avatar of the application or by the second avatar of the application, one or more operations defined by: the modified the first one or more instruction sets for operating the first avatar of the application, or the modified the copy of the first one or more instruction sets for operating the first avatar of the application. 64

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PETITIONER’S EXHIBIT LIST

Exhibit No.	Description
Ex. 1001	U.S. Patent No. 10,607,134
Ex. 1002	Prosecution File History for U.S. Patent No. 10,607,134
Ex. 1003	Declaration of Jason Janet, Ph.D.
Ex. 1004	Curriculum Viate of Jason Janet, Ph.D.
Ex. 1005	U.S. Patent No. 8,142,268 (“Thomas”)
Ex. 1006	U.S. Patent No. 9,434,072 (“Buehler”)
Ex. 1007	U.S. Patent No. 9,008,840 (“Ponulak”)
Ex. 1008	U.S. Patent App. Pub. No. 2003/0171146 A1
Ex. 1009	U.S. Patent App. Pub. No. 2003/0032467 A1
Ex. 1010	U.S. Patent No. 9,195,934
Ex. 1011	Silva, Marty, <i>A Visual History of American Football Games</i> , IGN, July 8, 2013, available at, https://www.ign.com/articles/2013/07/08/a-visual-history-of-football-video-games
Ex. 1012	Macy, Seth G., <i>A Visual History of Racing Games</i> , IGN, updated Sept. 6, 2017, available at, https://www.ign.com/articles/2015/03/27/a-visual-history-of-racing-games
Ex. 1013	<i>Final Fantasy XI Released</i> , IGN, updated June 16, 2012, available at, https://www.ign.com/articles/2003/10/29/final-fantasy-xi-released
Ex. 1014	Ellis, Tim, et al., <i>Ellipse Detection and Matching with Uncertainty</i> , pp. 137-144
Ex. 1015	Pomerleau, Dean A., <i>Neural Network Perception for Mobile Robot Guidance</i> , Feb. 16, 1992
Ex. 1016	Lee, Ten-min, et al., <i>Computer Simulation of Learning Experiments with Autonomous Mobile Robots</i> (Univ. of Manchester, March 26, 1999)
Ex. 1017	Durrant-Whyte, Hugh, et al., <i>Simultaneous Localisation and Mapping (SLAM): Part I The Essential Algorithms</i>
Ex. 1018	Smith, Randall, et al., <i>Estimating Uncertain Spatial Relationships in Robotics</i> , pp. 167-193

Ex. 1019	Zimmer, Kyle, <i>Evolution of the Game Console</i> , available at citadel.sjfc.edu/students-virtual/k/knz03095/public_html/imd/museum/index.html
Ex. 1020	Stuart, Keith, <i>PS4 and Xbox One: so why aren't they backwards compatible?</i> , The Guardian, December 12, 2013, available at https://www.theguardian.com/technology/2013/dec/12/ps4-and-xbox-one-so-why-arent-they-backwards-compatible
Ex. 1021	Christian, Mark, <i>Saved Game History: Battery Backups, Memory Cards, and the Cloud</i> , Mailchimp, Feb. 21, 2019, available at https://tedium.co/2019/02/21/video-game-save-state-history/

I. MANDATORY NOTICES

A. Real Party-in-Interest

Tesla, Inc. is the sole real party-in-interest.

B. Related Matters

U.S. Patent No. 10,607,134 (the '134 Patent) is the subject of a civil action, *Autonomous Devices LLC v. Tesla, Inc.*, No. 22-cv-1466 (MN) (D. Del.), filed November 7, 2022. Petitioner has also filed requests for *inter partes* review of the other asserted patents in the same civil action, including U.S. Patent Nos. 10,452,974, 11,238, 344, 10,607,134, 11,055,583, and 10,102,449.

C. Lead and Back-up Counsel and Service Information

Anish Desai (lead counsel) Reg. No. 73,760 Ian Moore (backup counsel) Reg. No. 77,395 Weil, Gotshal & Manges LLP 767 Fifth Ave. New York, NY 10153 T: 212-310-8000 F: 212-310-8007 anish.desai@weil.com ian.moore@weil.com Adrian Percer (backup counsel) Reg. No. 46,986 Adrian C. Percer (Reg. No. 46,986) Weil, Gotshal & Manges LLP 201 Redwood Shores Parkway Redwood Shores, CA 94065 T: 650-802-3000 F: 650-802-3100 adrian.percer@weil.com	Christopher Pepe (backup counsel) Reg. No. 73,851 Matthew Sieger (backup counsel) Reg. No. 76,051 Taylor J. Lawrence (backup counsel) Reg. No. 79,817 Allison D. Herzig (backup counsel) Reg. No. 80,747 Weil, Gotshal & Manges LLP 2001 M Street NW, Suite 600 Washington, DC 20036 T: 202-682-7000 F: 202-857-0940 christopher.pepe@weil.com matthew.sieger@weil.com taylor.lawrence@weil.com allison.herzig@weil.com
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II. GROUNDS FOR STANDING

Petitioner certifies that the '134 Patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting *inter partes* review challenging the patent claims on the grounds identified in this Petition.

III. INTRODUCTION

The '134 Patent claims a system or method of autonomously operating an avatar of an application in which a first one or more object representations are correlated with instruction sets for operating the avatar; a second one or more object representations are generated or received; instructions for operating the avatar are determined based on at least a partial match between the first and the second object representations; and the instruction sets are executed to autonomously operate the avatar. Ex. 1001, claim 1. Prior art that was not before the examiner during prosecution of the '134 Patent, including U.S. Patent No. 8,142,268 (“Thomas”) and U.S. Patent No. 9,434,072 (“Buehler”), anticipates and/or renders obvious all claims of the '134 Patent.

Thomas, for example, discloses the same approach to autonomously operating an avatar in an application. Thomas describes storing instruction sets that are correlated with situations and/or events, which include object representations of other avatars in the video game (*e.g.*, the spatial position of the avatars on the court or field):

During the learning mode, the simulator is configured to monitor the user's interaction with the computer program.... The simulator is further configured to *record one or more user inputs in response to the occurrence of the one or more events¹*....

Ex. 1005, 2:26-31.

One common parameter that defines a situation may be time.... Another parameter may be the *spatial position(s) of the avatars controlled by one or more user opponents*....

Ex. 1005, 4:29-33. Thomas further describes comparing the stored situations and/or events, including the object representations, with new object representations of the avatars on the field generated during simulation mode, and executing the instruction sets when there is a match:

During the simulation mode of operation, the simulator is configured to *monitor the computer program for the one or more particular events*, retrieve the one or more data fields associated with the one or more particular events, and *invoke one or more simulated inputs based on the value of the one or more data fields in response to the occurrence of the one or more events*.

Ex. 1005, Abstract.

¹ Emphasis added unless otherwise noted.

This Petition demonstrates that there is a reasonable likelihood that at least one of the challenged claims is unpatentable, and Petitioner respectfully requests that the Board institute review.

IV. STATUTORY GROUNDS FOR THE CHALLENGES

Ground 1	Anticipation of claims 1-20 based on U.S. 8,142,268 (“Thomas”)
Ground 2	Obviousness of claims 3, 5, and 12-14 based on Thomas
Ground 3	Anticipation of claims 1, 3, and 17 based on U.S. Patent No. 9,434,072 (“Buehler”)

V. LEVEL OF ORDINARY SKILL IN THE ART

A person having ordinary skill in the art (“POSITA”) would have had at least (1) a bachelor’s degree in electrical engineering, computer engineering, computer science, systems engineering, or equivalent course work with two to three years of work experience in computer vision, image/video processing, and/or machine learning; or (2) a master’s degree in any of those fields with a focus in computer vision, image/video processing, and/or machine learning. Ex. 1003, ¶ 37-39.

VI. CLAIM CONSTRUCTION

The Petition applies the ordinary and customary meaning of the claim terms as described in the analysis of how the prior art invalidates the ’134 Patent. The following section addresses the constructions of terms under 35 U.S.C. § 112(f).

A. “means for generating or receiving...”; “means for determining ...”; “means for executing...” [claim 19]

Claim 19 requires a “means for generating or receiving a second one or more object representations,” a “means for determining the first one or more instruction sets for operating the first avatar of the application based on at least partial match between the second one or more object representations and the first one or more object representations,” and a “means for executing, at least in response to the determining, the first one or more instruction sets for operating the first avatar of the application.” Ex. 1001, claim 19. The specification describes that a corresponding structure for performing these functions is one or more processor circuits or processors. Ex. 1001, 17:19-54 (stating that the system includes a “one or more processor circuits” that perform the functions of receiving new object representations (*i.e.*, a second object representation), anticipating (*i.e.*, determining) the first one or more instruction sets, and executing the first one or more instruction sets.); *see also id.*, 17:40-18:8; claim 1 (requiring that one or more processors perform the generating/receiving, determining, and executing steps); Ex. 1003, ¶ 64-66. Dependent claim 20 confirms that a corresponding structure for these functions is one or more processors or processor circuits. Ex. 1001, claim 20.

VII. OVERVIEW OF THE '134 PATENT

The '134 Patent was filed on December 19, 2016 and does not claim priority to any earlier-filed application. The '134 Patent relates to “learning an avatar’s

circumstances including objects with various properties along with correlated instruction sets for operating the avatar, storing this knowledge..., and/or operating an avatar autonomously.” Ex. 1001, 57:61-65.

Figure 30, copied below, illustrates this functionality, including the steps of correlating and storing a first collection of object representations with one or more instruction sets for operating an avatar, and executing the instruction set correlated with the first object representations upon detecting at least a partial match between new object representations and the first object representations:

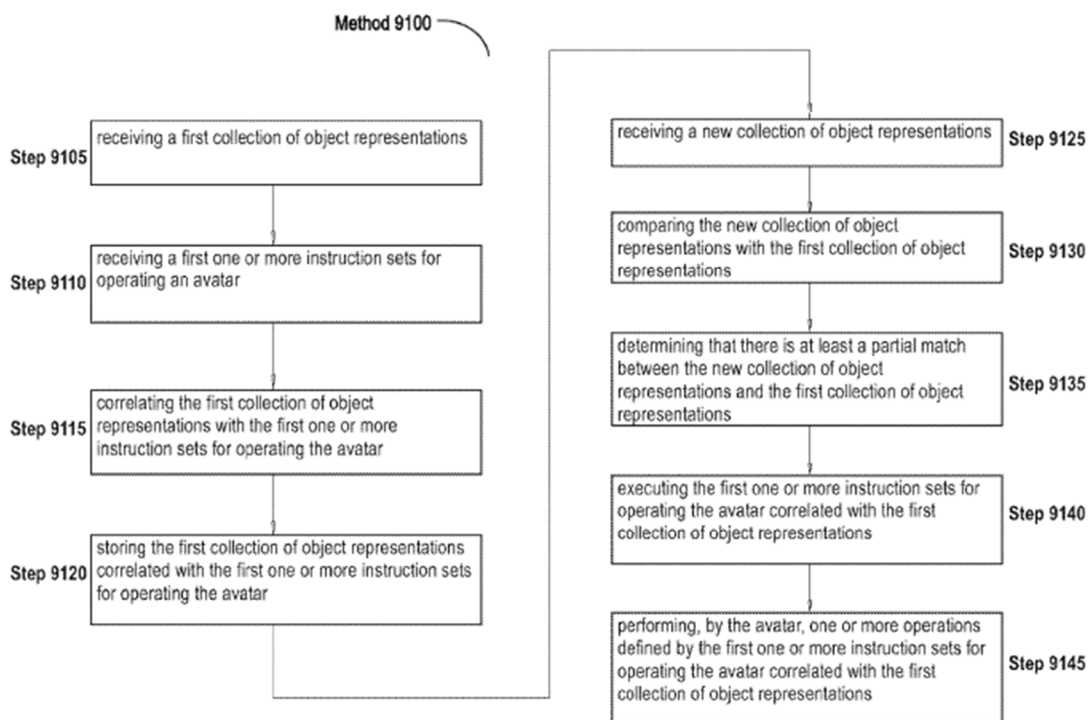


FIG. 30

Ex. 1001, Fig. 30

The '134 Patent describes that the disclosed system and method enables “learning of a particular User’s 50 knowledge, methodology, or style of operating Avatar 605,” Ex. 1001, 84:32-48, such as a “game player...operating Soldier 605a within 3D Game Application 18a.” Ex. 1001, 165:59-61.

VIII. OVERVIEW OF THE PRIOR ART

A summary of each reference used in the Grounds set forth herein is provided below.

A. U.S. 8,142,268 (“Thomas”)

Thomas is a U.S. patent that issued on March 27, 2012, and is prior art under at least 35 U.S.C. § 102(a)(1).

Thomas discloses “systems and methods for simulating a particular user’s behavior in an interactive computer system,” such as a video game. Ex.1005, Abstract, 4:25-27. Thomas describes that its system includes a simulator 120, which “generally operates in two modes: (1) learn, or record, mode and (2) simulation, or playback, mode.” *Id.*, 3:42-51.

During learning mode, “the simulator 120 will record the user’s decision/input, such as a pressed button, combination of buttons, or joystick move of a controller, in response to the particular situation and/or event,” *Id.*, 4:67-5:5, where the situation can include “the spatial position of avatars...on the interface screen.” *Id.*, 4:29-39.

Thomas describes that during simulation/playback mode, the system “monitors and analyzes the operation of the computer program in search of particular events and/or situations.” *Id.*, 5:34-36. Thomas further explains that if “a particular event and/or situation occurs” that corresponds to one stored during learning mode, “the simulator 120 can invoke a corresponding reaction based on the stored data, thereby simulating the user.” *Id.*, 5:27-29.

B. U.S. Patent No. 9,434,072 (“Buehler”)

Buehler was filed on September 17, 2012 and issued on September 6, 2016. Buehler is therefore prior art under 35 U.S.C. § 102(a)(1) and/or (a)(2).

Buehler discloses systems and methods “for robot learning and robot training.” Ex. 1006, 1:65. Buehler describes that the system compares stored templates of images to images captured by a camera located on the robot, and executes stored instructions that cause the robot to perform certain actions when the template and captured images sufficiently match. *Id.*, 18:50-54 (“The detection algorithm 508 *compares real-time camera images against the template* and determines...whether the real-time image contains the object of interest.”), 22:42-43 (“If the robot detects, for instance, a conveyor belt, it may select an action for picking up objects....”).

Buehler further describes a training mode, whereby the robot creates a virtual representation of the robot’s end effector to simulate an action upon detecting a

particular object (*e.g.*, picking it up with grippers). *Id.*, 19:34-36 (“[T]he robot may test its performance by simulating detection of the object using the model...”), 21:47-50 (“[T]he robot may overlay virtual grippers on the image (or video stream) of the object to indicate where the grasp point would be, given the current arm location and orientation....”).

IX. IDENTIFICATION OF HOW THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Grounds 1 and 2: Claims 1-20 Are Anticipated by Thomas; Claims 3, 5, 12-14 Are Obvious Based on Thomas in View of the Knowledge of a POSITA

1. Claim 1

Thomas anticipates claim 1. Ex. 1003, ¶ 228-245.

a. [1.1] A system comprising: one or more processors; and

Thomas discloses a system comprising one or more processors. Ex. 1005, Abstract (“The field of the invention relates to... simulating a particular user’s behavior in an interactive *computer system*”); claim 1 (“[A] computer-usable medium having a sequence of instructions stored thereon, which...causes said *processor* to execute a first process.”); Ex. 1003, ¶ 229.

- b. **[1.2] and one or more non-transitory machine readable media storing machine readable code that, when executed by the one or more processors, causes the one or more processors to perform at least:**

Thomas discloses a non-transitory machine readable media², such as a memory or server, that stores machine readable code (*e.g.*, instructions) that is executed by one or more processors to perform a variety of steps. Ex. 1005, 19:35-46 (describing that the computer program can reside on a server); *id.*, claim 1 (“A computer program product comprising *a computer-usable medium having a sequence of instructions stored thereon*, which...causes said processor to execute a first process”), claim 19 (requiring that the simulator is located on a “portable memory device”); *see also id.*, 13:60-19:34; Ex. 1001, 60:53-56 (explaining that “code” can comprise “instructions that can provide functionality when executed by processor”); Ex. 1003, ¶ 230-231.

² The ’134 Patent specification describes that “non-transitory machine readable medium” comprises “*all machine-readable media* except for a transitory, propagating signal,” Ex. 1001, 64:26-28, and includes “any memory” or “storage medium.” *Id.*, 64:12-25; Ex. 1003, ¶ 229.

- c. **[1.3] accessing a first correlation including a first one or more object representations correlated with a first one or more instruction sets for operating a first avatar of an application, wherein the first one or more object representations represent one or more objects of the application;**

Thomas discloses limitation [1.3]. Ex. 1003, ¶ 232-236. Thomas describes that during learning mode, “if a first user is using the computer program 110, the simulator 120 collects and evaluates data about the first user’s input when interacting the computer program 110...[and] the collected data is stored in the database 130.” Ex. 1005, 3:53-61. The stored data includes the user’s input for controlling an avatar in the computer program (i.e., an instruction set for operating an avatar object of an application program) in association with the surrounding circumstances or situation. *Id.*, 5:7-13 (“[T]he data recorded can be associated with both an event and a situation...[T]he user’s response, when recorded, is not only associated with the occurrence of that event, but also with the situation during the occurrence of that event, which is defined by one or more current circumstances.”); *see also id.* 4:67-5:5 (“[T]he simulator 120 will record the user’s decision/input, such as a pressed button, combination of buttons, or joystick move of a controller, in response to the particular situation...and store the user’s input in the field or sub-profile associated with the particular situation”); Ex. 1003, ¶ 232.

Thomas further discloses that the recorded situation defined by one or more circumstances that is associated with the user’s input “may be the spatial position(s)

of the avatars controlled by one or more user opponents 665 of the game” such as in football, basketball, or first person shooter games, or “virtual weather in games such as golf, or road conditions of racing games.” Ex. 1005, 4:16-54; *see also* 7:65-8:1 (“record[ing], as a current circumstance, the location of the user’s avatar that catches and shoots [in a basketball video game]”), 8:66-9:9 (discussing Fig. 5 which is “a diagram representing a video game interface” that “includes a graphical representation of a football field 310, and two sets of avatars 320, each representing a football team”), 9:43-53 (“[T]he user’s input is logically linked to an event and/or situation.... Current circumstances can also include the spatial location of individual avatars....”); Ex. 1003, ¶ 233.

The current circumstances that are stored, such as the spatial position of avatars and the virtual road conditions, includes one or more “object representations” as that term is used in the ’134 Patent. Ex. 1003, ¶ 234. The ’134 Patent states that “Object Representations” may include “any information related to an object,” such as location. Ex. 1001, 69:2-7 (“Object Representation 625 may include a representation of an object.... As such, Object Representation 625 may include any information related to an object.”); *see id.*, 69:1-8 (“Examples of Object Properties 630...include existence of Object 615, type of Object 615 (i.e. *person*, animal, tree, rock, building, vehicle, etc.)...,identity of Object 615 (i.e. name, identifier, etc.),...*location of Object 615*....”); *see id.*, 70:32-40. As explained by Dr. Janet,

the spatial position of an avatar, and virtual weather and road conditions described by Thomas are information related to an object, and comprise object representations as described by the '134 Patent. Ex. 1003, ¶ 234.

Thomas further describes that during simulation mode, the system accesses the stored correlations to simulate the user's control of the avatars. Ex. 1005, 5:30-34 (describing that in simulation mode the “simulator 120 retrieves the second user's profile” and if “there is a stored user input value...the simulator 120 will generate a response...which would represent the second user's response to the occurring situation or event....”). *Id.* at 5:30-61; Ex. 1003, ¶ 235. In one example, Thomas describes recording a specific user-controlled player (*i.e.*, a first avatar) pump faking (*i.e.*, executing an instruction set) during learning mode that is correlated with the defensive coverage (*i.e.*, object representations of the defensive players), which the system accesses during simulation mode to simulate the user-controlled avatar (*i.e.*, the first avatar) invoking a pump fake during the same situation:

For a pump fake event, *during the learning mode 550, the simulator 120 records how often a user pump fakes. For current circumstances, the simulator 120 records how covered the user was and user's location. During playback mode 600, the simulator 120 will monitor for a shoot event and analyze the location of the simulated user and the defensive coverage. If criteria is met, then simulator 120 will invoke a pump fake.*

Ex. 1005, 8:8-15; *id.* 7:55-64 (describing correlation between instruction set and object representations during a pass event); *see also id.*, 7:39-44, 10:56-11:3, 11:11-22, 12:63-13:1; Ex. 1003, ¶ 236.

Accordingly, Thomas discloses accessing a first one or more object representations (*e.g.*, spatial position of avatars on the interface screen or road conditions) correlated with a first one or more instruction sets (*e.g.*, pressed button, combination of buttons, joystick move of controller) for operating a first avatar (*e.g.*, a football player, basketball player, car) of an application (*e.g.*, video game). Ex. 1003, ¶ 232.

d. **[1.4] generating or receiving a second one or more object representations, wherein the second one or more object representations represent one or more objects of the application;**

Thomas discloses limitation [1.4]. *Id.*, ¶ 237-240. Thomas describes that during simulation/playback mode, the system generates a second one or more object representations, including representations of defensive players on the opposing team and their spatial position on the field or court. Ex. 1005, 3:49-51 (“*The simulator 120 generally operates in two modes: (1) learn, or record, mode and (2) simulation, or playback, mode.*”), 7:39-44 (“During playback mode 600, when an inbound event occurs the simulator 120 will...*analyze the current situation, such as time, score, and spatial position of defensive avatars* to determine which action to invoke that represents the simulated user.”); *see also* 7:45-8:15; Ex. 1003, ¶ 237. Thomas

discloses a pump fake, for example, in which the system monitors the generation of second object representations, such as the defensive coverage (*i.e.*, object representations of the defensive players). *Id.*, 8:11-14 (“During playback mode 600, the simulator 120 will monitor for a shoot event and *analyze the location of the simulated user and the defensive coverage.*”).

As explained for limitation [1.5], a POSITA would have understood that in Thomas’s system the second object representations (*e.g.*, spatial position of other avatars on the field/court, virtual weather, road conditions) are also received by Thomas’s processor to compare the situation/event generated during simulation mode to the situation/event recorded during learning mode. *See* Section IX.A.1.e *infra*; Ex. 1003, ¶ 238-240.

- e. **[1.5] determining the first one or more instruction sets for operating the first avatar of the application based on at least partial match between the second one or more object representations and the first one or more object representations; and**

Thomas discloses limitation [1.5]. Ex. 1003, ¶ 241-242.

Thomas discloses that “[t]he stored data enables the analysis of a user’s behavior, tendencies, and inclinations for a given event [and,] [t]hus... the simulator 120 can invoke a corresponding reaction based on the stored data, thereby simulating the user.” Ex. 1005, 5:25-29. Thomas further discloses that during simulation mode the system compares the first object representations recorded during learning mode

(e.g., the spatial position of defenders) to the second object representations generated and received during simulation mode (e.g., the spatial position of defenders), and determines instructions for operating the avatar of a simulated user in response to a match, such as determining that the same avatar that the user controlled during learning mode (*i.e.*, the first avatar) should pump fake:

For a pump fake event, during the learning mode 550, the simulator 120 records how often a user pump fakes. For current circumstances, the simulator 120 *records how covered the user was* and user's location. During playback mode 600, the simulator 120 will monitor for a shoot event and *analyze the location of the simulated user and the defensive coverage. If criteria is met, then simulator 120 will invoke a pump fake.*

id., 8:8-15; *see also id.* 7:39-44, 7:65-8:7, 10:56-11:3, 11:11-22, 12:63-13:1; Ex. 1003, ¶ 241-242.

- f. **[1.6] at least in response to the determining, causing the first avatar of the application or a second avatar of the application to perform one or more operations defined by the first one or more instruction sets for operating the first avatar of the application at least by executing the first one or more instruction sets for operating the first avatar of the application.**

Thomas discloses limitation [1.6]. Ex. 1003, ¶ 243-245.

As explained above for limitation [1.5], Thomas discloses invoking an action for an avatar in an application program in simulation mode based on stored data when a particular event or situation occurs. Ex. 1005, 5:25-29; *see* Section IX.A.1.e *supra*; Ex. 1003, ¶ 243. For example, Thomas describes that the system causes the

avatar of the simulated user (*i.e.*, the first avatar)³ to perform a pump fake or pass (*i.e.*, the operation defined by the instruction set) in response to detecting a match with respect to the spatial location of defensive players (*i.e.*, the first and second object representations) and determining the corresponding instruction set. *Id.*, 8:12-15 (“[T]he simulator 120 will monitor for a shoot event and *analyze the location of the simulated user and the defensive coverage. If criteria is met, then simulator 120 will invoke a pump fake.*”); *id.*, 7:55-64 (causing avatar of the simulated user to pass upon detecting a match of the defensive coverage); Ex. 1003, ¶ 244.

2. Claim 2

- a. **[2.1] The system of claim 1, wherein the first one or more object representations include: one object representation, a stream of object representations, a collection of object representations, or a stream of collections of object representations,**

Thomas discloses limitation [2.1]. Ex. 1003, ¶ 246.

Thomas describes that when the system records information concerning a situation and/or event during learning mode, the system can store one object

³ Although not required by claim 1, Thomas also discloses a “second avatar of the application,” which can be any second player on the user-controlled team in a sports game during learning mode that the system simulates during simulation mode. Ex. 1005, 7:2-4; Ex. 1003, ¶ 245.

representation (*i.e.*, a single defender) or a collection of object representations (*i.e.*, multiple defensive players on the opposing team). *See id.*, 7:57-59 (“[T]he simulator 120 records how open the receiving avatar was and how covered the passing avatar was” during pass event), 8:8-15 (describing recording defensive coverage during a pump fake event).

- b. **[2.2] and wherein the second one or more object representations include: one object representation, a stream of object representations, a collection of object representations, or a stream of collections of object representations,**

Thomas discloses limitation [2.2]. Ex. 1003, ¶ 247.

Thomas describes that during simulation mode, the system generates and receives a second one or more object representations of the defensive players in the game, which can include one defensive player (an object representation) or multiple defensive players (a collection of object representations) during a pump fake or pass event. Ex. 1005, 8:11-15 (“During [simulation] mode 600, the simulator 120 will... analyze the location of the simulated user and *the defensive coverage*. If criteria is met, then simulator 120 will invoke a pump fake.”); *id.* at 7:55-64 (generating object representations of defensive coverage during a pass event).

- c. **[2.3] and wherein the one or more objects of the application represented by the first one or more object representations are detected at a first time or during a first time period, and wherein the one or more objects of the application represented by the second one or more object representations are detected at a second time or during a second time period.**

Thomas discloses limitation [2.3]. Ex. 1003, ¶ 248.

As explained above, Thomas discloses detecting the first one or more object representations associated with a pump fake or pass during the learning mode, and detecting the second one or more object representations associated with a pump fake or pass during simulation mode. *See* Section IX.A.1.c-d & IX.A.2.a-b. *supra*. A POSITA would have understood that the learning mode occurs at a first time, while the simulation mode would occur at a different second time. Ex. 1003, ¶ 248.

3. Claim 3

- a. **[3.1] The system of claim 1, wherein the determining the first one or more instruction sets for operating the first avatar of the application based on the at least partial match between the second one or more object representations and the first one or more object representations includes:**

Thomas discloses limitation [3.1]. *See* Section IX.A.1.e *supra* ; Ex. 1003, ¶ 249.

- b. **[3.2] determining that a number of at least partially matching portions of the second one or more object representations and portions of the first one or more object representations exceeds a threshold number, or determining that a percentage of at least partially matching portions of the second one or more object representations and portions of the first one or more object representations exceeds a threshold percentage.**

Thomas discloses and renders obvious limitation [3.2]. Ex. 1003, ¶ 250-251.

The '134 Patent specification describes that the threshold number or percentage can be any number. *See* Ex. 1001, 115:2-7 (“[S]ubstantial similarity can be achieved when at least a threshold number (i.e. 1, 2, 3, 6, 11, etc.) or percentage...match or substantially match.”); Ex. 1003, ¶ 250.

Thomas describes comparing the first and second object representations, and executing an instruction set when the object representations of the defensive players observed in simulation mode at least partially match those recording during learning mode. *See* Section IX.A.1.e *supra*. A POSITA would have understood that determining whether the criteria is met (i.e., whether there is at least a partial match) would involve determining whether the matching portions exceed a numerical threshold, such as the number of defenders and the distance of the defenders from the simulated avatar (i.e., the first avatar), as described in the pump fake (*i.e.*, the criteria) and pass out of shot (*i.e.*, how much the avatars are covered) examples. Ex. 1005, 7:62-64 (“The simulator 120 will invoke a pass if the current circumstances

meet the criteria, e.g., *how much* the passing and receiving avatars are covered.”), 8:13-15 (“[T]he simulator 120 will...*analyze the location of the simulated user and the defensive coverage. If criteria is met*, then simulator 120 will invoke a pump fake.”); *see also* Ex. 1003, ¶ 251. Moreover, it would have been obvious to use a threshold number or percentage to determine whether the criteria regarding defensive coverage is met in order to invoke the simulated action (*i.e.*, a threshold number or percentage regarding how much the avatars are covered). Ex. 1003, ¶ 251.

4. Claim 4

a. **[4.1] The system of claim 1, wherein the first correlation is included in a knowledgebase,**

Thomas discloses limitation [4.1]. Ex. 1003, ¶ 252-254.

The '134 Patent describes that a Knowledgebase “*may be or include any data structure or arrangement capable of storing knowledge of Avatar’s 605 operation in circumstances including objects with various properties.*” Ex. 1001, 103:42-45; Ex. 1003, ¶ 252.

Thomas discloses a knowledgebase because it describes that the instruction sets correlated with situations and/or events are stored in a database (*i.e.*, a data structure capable of storing knowledge of avatar’s operation in circumstances). Ex. 1005, 3:41-49 (“...a database 130...which stores data used by the simulator 120 to calculate and generate the decisions and behavior.”), 3:56-61 (“The collected data

is...stored in the database 130 (action block 210). The data is stored in a data structure, generally referred to as a user's profile...."); Ex. 1003, ¶ 253-254.

- b. **[4.2] and wherein the knowledgebase further includes a third correlation including a third one or more object representations correlated with a third one or more instruction sets for operating: the first avatar of the application, the second avatar of the application, a third avatar of the application, or an avatar of another application, and**

Thomas discloses limitation [4.2]. Ex. 1003, ¶ 255-256.

Thomas describes that the system stores multiple correlations (*i.e.*, first, second, and third correlations), each of which includes one or more object representations correlated with an instruction set for autonomously operating the user-controlled avatar (*i.e.*, the first avatar) during simulation mode in different situations and/or events (*e.g.*, a pump fake, pass out of shot event, inbound event, three-point line, offensive rebound, etc.). *See* Section IX.A.1.c *supra*]; *id.*, 7:22-8:27 (“For example,...an event may be an inbound event, an offensive rebound event, a pass out of shot event, a catch and shoot event, a pump fake event, defensive steal event, and/or a shot event....”); Ex. 1003, ¶ 255.

Thomas further describes storing at least three correlations (*i.e.*, first, second, and third correlations), each comprising one or more object representations for the same situation and/or event that occur at different times during learning mode that are correlated with different instruction sets (*e.g.*, juking, spin left, spin right) for

autonomously operating the user-controlled avatar (*i.e.*, the first avatar) during simulation mode. *Id.*, 6:19-23 (“In one hundred (100) occurrences of the event, if the user *spun left* twenty (20) times, *right* thirty (30) times, and *juked* fifty (50) times, the simulator 120 will assign values of twenty (20), thirty (30), and fifty (50) to the respective responses”); Ex. 1003, ¶ 256.

c. **[4.3] wherein the third one or more object representations represent one or more objects of: the application, or the another application, and**

Thomas discloses limitation [4.3]. Ex. 1003, ¶ 257.

As explained above, Thomas discloses first, second, and third correlations including instruction sets correlated with situations/events, each of which includes object representations that represent the defensive players in the game (*i.e.*, objects of the application). *Id.* at 7:22-8:27; *see* Section IX.A.4.b *supra*.

d. **[4.4] wherein the first correlation is connected with the third correlation by a connection.**

Thomas discloses limitation [4.4]. Ex. 1003, ¶ 258-260.

The '134 Patent describes that a connection “may include or be associated with a value such as a symbolic label or numeric attribute (*i.e.* weight, cost, capacity, length, etc.)” and “may include or be associated with occurrence count, weight, and/or other parameters or data.” Ex. 1001, 105:35-38, 107:51-53; Ex. 1003, ¶ 259.

Thomas discloses that the first correlation is connected with the third correlation by a connection. As described above, Thomas describes assigning

numerical occurrence weight values to a group of correlations that include different instruction sets for the same situation/event (*i.e.*, connections). Ex. 1005, 6:19-23 (“In one hundred (100) *occurrences of the event*, if the user spun left twenty (20) times, right thirty (30) times, and juked fifty (50) times, the simulator 120 will assign values of twenty (20), thirty (30), and fifty (50) to the respective responses”), 6:28-30 (“[T]he simulator 120 can randomly invoke a response to a situation and/or event based on *weighted statistical values* of the stored inputs.”); see Section IX.A.4.b *supra*; Ex. 1003, ¶ 260. Accordingly, Thomas discloses that correlations (*i.e.*, first, second, and third correlations) that share a common situation/event are connected to each other via a numerical attribute (*i.e.*, a weighted occurrence value). Ex. 1003, ¶ 258, 260.

5. Claim 5: The system of claim 1, wherein the second avatar of the application performs the one or more operations defined by the first one or more instruction sets for operating the first avatar of the application.

Thomas discloses and renders obvious claim 5. Ex. 1003, ¶ 261-263.

Thomas teaches using a default instruction set for a simulated avatar if no previously recorded response is stored:

If there is no value, i.e., stored user input, recorded for the given the event and/or situation, then the simulator 120 will generate a random or *default response* representing the second user’s simulated input....

Ex. 1005, 5:54-58. A POSITA would have understood and it would have been obvious that a “default response” would be a preprogrammed response that is correlated with one or more situations/events. Ex. 1003, ¶ 261. Thomas further describes that different basketball players can be classified by archetype, such as a shooter, etc. *Id.*, 4:49-51 (“[A]rchetypes can include true point guard, slasher, shooter, pure shooter, low post scorer....”). A POSITA would have understood, and it would have been obvious, that the default instruction set (*e.g.*, pump faking or passing) would be the same for two different avatars (*i.e.*, a first avatar and a second avatar) on the same team with the same archetype (*e.g.*, “shooter”). Ex. 1003, ¶ 261. Accordingly, the second avatar would autonomously perform the operation defined by the first instruction set (*i.e.*, a default instruction set) for operating the first avatar when there is no stored instruction set for those avatars for a particular situation. *Id.*, ¶ 262.

Thomas also renders obvious this limitation because it describes storing instruction sets correlated with object representations for a first avatar that are learned in learning mode, and that the system records the archetype associated with that avatar, as described above. *See also* Section IX.A.1.c *supra*. It would have been obvious that a learned instruction set for a first avatar would be applied to a second avatar of the same archetype if there is no stored correlation for the second avatar, such as multiple avatars that are shooters. Ex. 1003, ¶ 263. A POSITA would

understand that stored instruction sets can be applied to different avatars, because for example, Thomas discloses that the system can invoke a stored instruction set in response to a situation based on time, score, and the spatial position of the defense without requiring the simulated avatar be the same avatar used during learning mode. *See e.g.*, Ex. 1005, 7:39-44 (“[T]he simulator 120 will...*analyze the current situation, such as time, score, and spatial positions of defensive avatars, to determine which action to invoke* that represents the simulated user.”); *see also id.* 7:50-54, 8:2-7, 8:11-15; Ex. 1003, ¶ 263.

6. Claim 6

- a. **[6.1] The system of claim 1, wherein the one or more objects of the application represented by the first one or more object representations include one or more objects of the application in the first avatar’s surrounding,**

Thomas discloses limitation [6.1]. Ex. 1003, ¶ 264.

Thomas describes that correlations recorded during learning mode include first object representations of defensive players on the field or court, which are objects of the application in the first avatar’s surrounding (*i.e.*, the surroundings of a user-controlled avatar during learning mode). Ex. 1005, 7:55-64 (describing defensive players in the surroundings of the first avatar during a pass), 8:8-15 (describing defensive players in surroundings of first avatar during a pump fake).

- b. **[6.2] and wherein the one or more objects of the application represented by the second one or more object representations include: one or more objects of the application in the first avatar's surrounding, or one or more objects of the application in the second avatar's surrounding, and**

Thomas discloses limitation [6.2]. Ex. 1003, ¶ 265-66.

Thomas describes that the object representations generated during simulation mode (*i.e.* the second one or more object representations) include one or more objects in the surroundings of the first avatar (*i.e.*, a simulated user's avatar), such as object representations of the defensive players surrounding the first avatar. *Id.*, 7:41-42 (describing that during simulation mode the simulator “analyze[s] the current situation, such as...[the] spatial positions of defensive avatars.”), 7:55-64 (describing defensive players in the surroundings of the first avatar during a pass in simulation mode), 8:8-15 (describing defensive players in surroundings of first avatar during a pump fake in simulation mode); Ex. 1003, ¶ 265.

Thomas also discloses that object representations of the defensive players generated during simulation mode (*i.e.* the second one or more object representations) include one or more objects in the surroundings of a second avatar (*i.e.*, a second player on the simulated team), such as object representations of the defensive players in the surroundings of a second avatar on a simulated user's basketball team that receives a pass. Ex. 1005, 7:62-64 (“The simulator 120 will invoke a pass if the current circumstances meet the criteria, *e.g.*, how much the

passing and receiving avatars are covered.”), *id.*, 7:2-4 (“[T]he computer program 110 can be *a team sports video game, such as football, basketball...etc.*”); Ex. 1003, ¶ 266

- c. **[6.3] wherein the first avatar’s surrounding includes at least one of: a part of the application in an area of interest around the first avatar,[...] a part of the application that is visible to a user, or a part of the application,**
- d. **[6.4] and wherein the second avatar’s surrounding includes at least one of: a part of the application in an area of interest around the second avatar, [...] a part of the application that is visible to a user, or a part of the application.**

Thomas discloses limitation [6.3] and limitation [6.4]. Ex. 1003, ¶ 267-268.

Specifically, Thomas describes that the object representations of the objects in the area surrounding first and second avatars are in areas of interest to the first and second avatars, such as defensive players near the first and second avatars on the field or court. Ex. 1005, 8:11-14 (“During playback mode 600, the simulator 120 will monitor for a shoot event and *analyze the location of the simulated user and the defensive coverage.*”); *see also* 7:39-44, 7:50-54, 7:59-64; Ex. 1003, ¶ 267-268. A POSITA would also understand that the areas of interest are visible to the user because the video game includes a graphical representation of the field or court. *See e.g.*, 8:67-9:3 (explaining that the interface “*generally includes a graphical representation of a football field 310.*”). Ex. 1003, ¶ 267-268.

7. **Claim 7: The system of claim 1, wherein, to correlate the first one or more object representations with the first one or more instruction sets for operating the first avatar of the application, a determination is made that the first one or more instruction sets for operating the first avatar of the application temporally correspond to the first one or more object representations.**

Thomas discloses claim 7. Ex. 1003, ¶ 269-271.

The '134 Patent describes that instruction sets temporally correspond to object representations when the instruction sets are executed at the time the first object representations are generated. Ex. 1001, 29:4-8 (“The one or more instruction sets that *temporally correspond* to the first stream of collections of object representations *may include one or more instruction sets executed at a time of generating* the first stream of collections of object representations.”); Ex. 1003, ¶ 269. Thomas discloses this limitation because it describes that during learning mode the user inputs commands that the user-controlled avatar executes (*i.e.*, the first instruction set) at the same time that the first object representations are generated on the video interface screen, such as when a user initiates a command in response to certain defensive coverage of opposing players. Ex. 1005, 7:55-59 (“[T]he simulator 120, during learn mode 550, *records a shot type, which avatar passed, and which avatar was passed to*. For current circumstances, the simulator 120 *records how open the receiving avatar was and how covered the passing avatar was*.”), 8:8-15 (recording object

representations at the same time as pump fake command during learning mode); Ex. 1003, ¶ 270.

Thomas also discloses this limitation because it describes storing temporal information (*e.g.*, time left in the game when an instruction set is executed and the situation/event is generated) as part of the correlation between object representations (*e.g.*, the spatial position of the defenders) and instruction sets. *Id.*, 4:29 (“[o]ne common parameter that defines a situation may be time”); *see also id.* at 5:50-53 (describing that if “the time left on the play clock is less than two minutes...the simulator 120 will...determine whether the user would kick a field goal....”); Ex. 1003, ¶ 271.

8. Claim 8

- a. **[8.1] The system of claim 1, wherein at least some elements of the system are included in: a single device, or multiple devices, and**

Thomas discloses that some elements of the system can be included in a single or multiple devices (*e.g.*, console and/or server). Ex. 1005, 19:36-42 (“[C]omputer program 110, simulator 120, and database 130... *can reside on a single client console.... [or] a server 710 accessible by one or more client consoles....*”); Ex. 1003, ¶ 150, 272.

- b. **[8.2] wherein the one or more processors include: one or more microcontrollers, one or more computing devices, or one or more electronic devices, and**

Thomas discloses that the one or more processors include one or more computing devices or electronic devices, such as a video game console. Ex. 1005, 19:36-38 (“[T]he computer program 110, simulator 120, and database 130, as shown in FIG. 1, can reside on *a single client console...*”); Ex. 1003, ¶ 273.

- c. **[8.3] wherein the first correlation is stored in or on at least one of: at least one non-transitory machine readable medium of the one or more non-transitory machine readable media, another one or more non-transitory machine readable media, one or more volatile memories, one or more non-volatile memories, one or more storage devices, or one or more storage systems,**

Thomas discloses limitation [8.3]. Ex. 1003, ¶ 274.

Thomas discloses that the first correlation is stored in or on at least one or more storage devices or one or more storage systems (*e.g.*, a server). Ex. 1005, 19:35-42 (“[T]he *computer program 110, the simulator 120, and database 130*, as shown in FIG. 1, *can reside on a single client console, such as workstation 750 or video game console 760, such as Xbox or Playstation...or...can reside on a server....*”); Ex. 1003, ¶¶ 196, 274.

- d. **[8.4] and wherein the application includes: a video game, a computer game, a simulation program, a program including text processing, a program including number processing, a program including picture processing, a program including object processing, or a program, and**

Thomas discloses that the application includes a video game. Ex.1005, 7:2-3 (“[C]omputer program 110 can be a team sports video game....”); *see also id.* 19:35-42; Ex. 1003, ¶ 275.

- e. **[8.5] wherein the application includes: one or more versions of the application, one or more upgrades of the application, one or more sequels of the application, one or more instances of the application, or one or more variations of the application, and**

Thomas discloses that the application can include one version, such as NFL 2K5 or a particular basketball video game. Ex. 1005, 4:45-51, 8:55-59 (“Another example embodiment...is embodied in Visual Concepts’ ESPN NFL 2K5....”); Ex. 1003, ¶ 276.

- f. **[8.6] wherein the first avatar of the application is a first object of the application and the second avatar of the application is a second object of the application, and**

Thomas discloses limitation [8.6]. Ex. 1003, ¶ 277.

Thomas discloses that the first avatar and second avatar comprise objects of the application, such as avatars representing different players on a basketball or football video game. Ex. 1005, 4:48-51 (“In the case of a basketball game, wherein *avatars represent players of the game ...*”); *see* Section IX.A.1.c *supra*.

- g. **[8.7] wherein the first one or more object representations include one or more properties of the one or more objects represented by the first one or more object representations, and wherein the second one or more object representations include one or more properties of the one or more objects represented by the second one or more object representations, and**

Thomas discloses limitation [8.7]. Ex. 1003, ¶ 278.

Thomas discloses that the first and second one or more object representations include one or more properties of the objects they represent, respectively, such as the spatial position of the players on the basketball court or football field or the archetype of the object. *Id.*, 4:45-51 (describing archetypes); *see* Section IX.A.1.c *supra* (describing storing spatial position of objects); *see also* Ex. 1001, 70:32-41 (explaining that object properties can include the type or location of the object).

- h. **[8.8] wherein an instruction set of the first one or more instruction sets for operating the first avatar of the application includes at least one of: only one instruction, a plurality of instructions, one or more inputs, one or more commands, [...] or one or more information, and**

This limitation is satisfied by an instruction set that includes one or more instructions, inputs, or commands. Thomas discloses that the instruction set for operating the first object of the first application program can include one or more instructions, inputs, and/or commands, such as pushing a button to pump fake or pass a basketball. Ex. 1005, 4:67-5:2 (“[S]imulator 120 will record the user’s

decision/input, such as a pressed button, combination of pressed buttons....”); *id.*, 5:13-17, 5:26-29, 7:54-8:15; Ex. 1003, ¶ 279.

- i. **[8.9] wherein: an object of the application of the one or more objects of the application represented by the first one or more object representations is the same as an object of the application of the one or more objects of the application represented by the second one or more object representations, multiple objects of the application of the one or more objects of the application represented by the first one or more object representations are the same as multiple objects of the application of the one or more objects of the application represented by the second one or more object representations[....]**

Thomas discloses limitation [8.9] and specifically that an object or multiple objects of the one or more objects of the application represented by the first one or more object representations is/are the same as an object or multiple objects of the one or more objects of the application represented by the second one or more object representations. Ex. 1003, ¶ 280-282.

Thomas describes that the first one or more object representations stored during the learning mode can include representations of one or more defensive players on the opposing team. Ex. 1005, 7:55-64 (“For a pass out of shot...the simulator 120 records how open the receiving avatar was and how covered the passing avatar was.”), 8:8-12 (“For a pump fake event...the simulator 120 records how covered the user was and user’s location.”); *see also id.* 5:13-18; Ex. 1003, ¶ 281. Thomas further describes that during simulation mode, the simulator monitors

the game for the same situation and/or event, which includes identifying at least one of the same defensive players (i.e., second one or more object representations) that correspond to those generated and recorded during learning mode:

For a pump fake event, *during the learning mode 550*, the simulator 120 records how often a user pump fakes...*how covered the user was and user's location*. During playback mode 600, the simulator 120 will monitor for a shoot event and *analyze the location of the simulated user and the defensive coverage*. *If criteria is met*, then simulator 120 will invoke a pump fake.

Ex. 1005, 8:8-15; Ex. 1003, ¶ 281.

Thomas similarly discloses that the first and second object representations include the same player on the opposing team in a football game, such as when the user double teams the best receiver in learning mode, which is simulated in simulation mode. *Id.*, 12:25-29 (“*For a defensive play calling profile 530, the simulator 120 may store... when the user... makes adjustments to double team the best receiver on the opposing team.*”); Ex. 1003, ¶ 282 .

9. Claim 9: The system of claim 1, wherein the first correlation is included in a first knowledge cell, and wherein the first knowledge cell is a data structure for storing, structuring, or organizing the first correlation.

Thomas discloses claim [9]. Ex. 1003, ¶ 283-285.

The '134 Patent describes that a “knowledge cell” includes any structure that can store a correlation between an instruction set and object representation. Ex.

1001, 154:28-36 (“[A] knowledge cell may include any data structure or arrangement that can facilitate such storing....”); Ex. 1003, ¶ 283.

Thomas discloses a knowledge cell that is a data structure for storing, structuring, or organizing the first correlation because it describes that the system can include a “data structure, generally referred to as a user’s profile,” which includes data that “logically link[s],” *i.e.* correlates, the “user’s input” to the “event, or situation, that initiated” the input. Ex. 1005, 3:57-61; Ex. 1003, ¶ 284. Thomas further describes that the user’s profile can reside in a database stored “on a single client console” or “on a server 710 accessible by one or more client consoles via a network.” *Id.*, 19:38-42; Ex. 1003, ¶ 285.

10. Claim 10

Independent claim 10 is a method claim that corresponds to system claim 1. The analysis above explaining how Thomas anticipates claim 1 applied to claim 10 as set forth below. Ex. 1003, ¶ 286.

Claim 10	Disclosure of Thomas
A method implemented using a computing system that includes one or more processors, the method comprising:	<i>Supra</i> Section IX.A.1.a.

Claim 10	Disclosure of Thomas
accessing a memory that stores at least a first correlation including a first one or more object representations correlated with a first one or more instruction sets for operating a first avatar of an application, wherein the first one or more object representations represent one or more objects of the application;	<i>Supra</i> Section IX.A.1.b-c.
generating or receiving a second one or more object representations, wherein the second one or more object representations represent one or more objects of the application;	<i>Supra</i> Section IX.A.1.d.
determining the first one or more instruction sets for operating the first avatar of the application based on at least partial match between the second one or more object representations and the first one or more object representations; and	<i>Supra</i> Section IX.A.1.e.
at least in response to the determining, executing the first one or more instruction sets for operating the first avatar of the application, wherein the first avatar of the application or a second avatar of the application performs one or more operations defined by the first one or more instruction sets for operating the first avatar of the application.	<i>Supra</i> Section IX.A.1.f.

11. Claim 11

- a. **[11.1] The system of claim 1, wherein the first correlation is included in a knowledgebase, and**

Thomas discloses limitation [11.1]. *See* Section IX.A.4.a *supra* ; Ex. 1003, ¶ 287.

- b. **[11.2] wherein the knowledgebase further includes a third correlation including a third one or more object representations correlated with a third one or more instruction sets for operating the first avatar of the application, and**

Thomas discloses limitation [11.2]. *See* Section IX.A.4.b *supra*; Ex. 1003, ¶ 288.

- c. **[11.3] wherein the third one or more object representations represent one or more objects of the application, and**

Thomas discloses limitation [11.3]. *See* Section IX.A.4.c *supra*; Ex. 1003, ¶ 289.

- d. **[11.4] wherein at least a portion of the first correlation is learned in a learning process that includes operating the first avatar of the application at least partially by a user, and wherein at least a portion of the third correlation is learned in another learning process that includes operating the first avatar of the application at least partially by the user, and**

Thomas discloses limitation [11.4]; Ex. 1003, ¶ 290-292.

Thomas describes recording (*i.e.*, learning) object representations correlated with instruction sets (*e.g.*, first, second, and third correlations) when the user

operates the avatar (*i.e.*, the first avatar) in learning mode during different situations in the same game, each of which is a different learning process. Thomas at 5:5-7 (“A user’s *response to the occurrence of an event can differ depending upon the surrounding circumstances or situation...*”), 7:22-8:15 (describing recording situations and instruction sets during catch and shoot event, pump fake event, pass event, and defensive steal event); Ex. 1003, ¶ 290-291.

Thomas also discloses this limitation because it describes recording (*i.e.*, learning) object representations correlated with instruction sets when the user operates the first avatar during subsequent play of the same video game, wherein each instance of the game is a different learning process (*i.e.*, first and second learning processes). Ex. 1005, 10:19-32 (describing that the system can record correlations in 30 different plays of the same video game). Ex. 1003, ¶ 292. Thus, Thomas discloses that the first correlation is learned in one learning process, while the third correlation can be learned in another learning process (*i.e.*, subsequent play of the same game), both of which include operating the first avatar of the application at least partially by the user. Ex. 1003, ¶ 292.

e. **[11.5] wherein the user is: a human user, or a non-human user.**

Thomas discloses limitation [11.5]. Ex. 1003, ¶ 293.

In particular, Thomas describes recording inputs and instructions provided by a human user user during learning mode, such as input commands from a human

user operating a joystick while playing a video game. Ex. 1005, 4:64-5:5 (“the simulator 120 will record the user’s decision/input, *such as a pressed button, combination of buttons, or joystick move of a controller*, in response to the particular situation and/or event”), 8:8-10 (“[D]uring the learning mode 550, the simulator 120 records how often *a user pump fakes*.”).

12. Claim 12

- a. **[12.1] The system of claim 1, wherein the first correlation is included in a knowledgebase, and wherein the knowledgebase further includes a third correlation including a third one or more object representations correlated with a third one or more instruction sets for operating the first avatar of the application, and wherein the third one or more object representations represent one or more objects of the application, and**

Thomas discloses limitation [12.1]. *See* Section IX.A.4.a-c *supra*; Ex. 1003, ¶ 294.

- b. **[12.2] wherein at least a portion of the first correlation is learned in a learning process that includes operating the first avatar of the application at least partially by a user, and**

Thomas discloses limitation [12.2]. *See* Section IX.A.11.d *supra*; Ex. 1003, ¶ 293.

- c. **[12.3] wherein at least a portion of the third correlation is learned in another learning process that includes operating the first avatar of the application at least partially by another user, and**

Thomas discloses and renders obvious limitation [12.3]. Ex. 1003, ¶ 296-297.

Thomas describes that the system stores multiple profiles, each of which stores situations/events (*i.e.*, object representations) correlated with instruction sets for simulating operation of an avatar by different users:

Multiple users can compete against each other.... *[A]ny participating user can upload its own user profile for access by any other participating user*, and further any participating users can download or access any user profile available in the database 130.

Ex. 1005, 19:57-62; Ex. 1003, ¶ 296. A POSITA would have understood, and it would have been obvious, that when a second user plays with the same team and avatars as a first user (*e.g.*, different users playing with the Los Angeles Lakers), the object representations and instruction sets (*i.e.*, including first, second, and third object representations correlated with first, second, and third instruction sets) for operating the same player on the same team (*i.e.*, the first avatar) would be learned in another learning process that includes operating the first avatar of the application at least partially by another user. Ex. 1003, ¶ 297.

- d. **[12.4] wherein the user is: a human user, or a non-human user, and wherein the another user is: a human user, or a non-human user.**

Thomas discloses limitation [12.4]. Ex. 1003, ¶ 298.

As explained above, Thomas discloses that the users are humans that are operating joysticks when playing a video game. Ex. 1005, 4:64-5:5 (“the simulator 120 will record the user’s decision/input, *such as a pressed button, combination of buttons, or joystick move of a controller....*”), 8:8-10 (“[D]uring the learning mode 550, the simulator 120 records how often *a user pump fakes.*”); see Section IX.A.11.e *supra*.

13. Claim 13

- a. **[13.1] The system of claim 1, wherein the first correlation is included in a knowledgebase, and**

Thomas discloses limitation [13.1]. See Section IX.A.4.a *supra*; Ex. 1003, ¶ 299.

- b. **[13.2] wherein the knowledgebase further includes a third correlation including a third one or more object representations correlated with a third one or more instruction sets for operating a third avatar of the application, and**

Thomas discloses and/or renders obvious limitation [13.2]. Ex. 1003, ¶ 300-302. Thomas describes that in learning mode the system can detect and record multiple correlations (*i.e.*, first, second, and third correlations) “related to one or more events 685 and/or situations 655 that occur within the computer program 110

during operation,” such as for a pass, pump fake, rebound, etc. Ex. 1005, 4:14-16; *see* Element IX.A.4.b *supra*; Ex. 1003, ¶ 300. Thomas further describes and a POSITA would have understood that the system stores instruction sets correlated with object representations for simulating operation of multiple players on a team in a sports video game (*i.e.*, the application), such as multiple players (*i.e.*, first, second, and third avatars) on the same basketball team:

Another type of parameter, in the case of a computer *game involving one or more avatars*, is the archetype.... [*A*]rchetypes can include *true point guard, slasher, shooter, pure shooter, low post scorer, midrange scorer, and role player*.

Ex. 1005, 4:45-52; *see also id.* at 8:38-40 (“For each event, during learning mode 550, the simulator 120 records the archetype of the avatar that initiated a monitored event.”); Ex. 1003, ¶ 301. Thus, Thomas discloses and/or renders obvious a third correlation including a third one or more object representations correlated with a third one or more instruction sets (*i.e.*, the spatial position of defensive players and corresponding instructions for a pump fake, pass out of shot, defensive rebound) for operating a third avatar of the application (*i.e.*, any of three or more players on a basketball team that the user controlled during learning mode). Ex. 1003, ¶ 302.

- c. **[13.3] wherein the third one or more object representations represent one or more objects of the application,**

Thomas discloses limitation [13.3]. *See* Section IX.A.4.c *supra*; Ex. 1003, ¶ 303.

- d. **[13.4] and wherein at least a portion of the first correlation is learned in a learning process that includes operating the first avatar of the application at least partially by a user, and**

Thomas discloses limitation [13.4]. *See* Section IX.A.11.d *supra*; Ex. 1003, ¶ 304.

- e. **[13.5] wherein at least a portion of the third correlation is learned in another learning process that includes operating the third avatar of the application at least partially by: the user, or another user, and wherein the user is: a human user, or a non-human user, and wherein the another user is: a human user, or a non-human user.**

Thomas discloses limitation and/or renders obvious limitation [13.5]. Ex. 1003, ¶ 305-306.

As explained above, Thomas discloses that different correlations are learned in different learning processes in which the user operates different avatars on the same team during the same game (*i.e.*, different situations/events that occur at different times during the same game) or different learning processes that occur when the user encounters different situations/events across multiple games. *See* Section IX.A.11.d *supra*; Ex. 1003, ¶ 305. And as explained above, Thomas

discloses that the correlations are learned in a learning process that includes operating the avatars (including a third avatar) at least partially by a human user or non-human user. *See* Section IX.A.11.d-e & IX.A.12.c-d *supra*; Ex. 1003, ¶ 306.

14. Claim 14

- a. **[14.1] The system of claim 1, wherein the first correlation is included in a knowledgebase, and**

Thomas discloses limitation [14.1]. *See* Section IX.A.4.a *supra*; Ex. 1003, ¶ 307.

- b. **[14.2] wherein the knowledgebase further includes a third correlation including a third one or more object representations correlated with a third one or more instruction sets for operating an avatar of another application, and**

Thomas discloses and renders obvious limitation [14.2]. Ex. 1003, ¶ 308-311.

As explained above, Thomas discloses creating multiple correlations comprising object representations correlated with instruction sets for operating avatars in an application, including a third correlation. *See* Section IX.A.4.b & IX.A.13.b *supra*; Ex. 1003, ¶ 308.

Thomas also describes that users are able to play computer programs/games on multiple different “client console(s)” including “workstation 750” and “video game console 760, such as an Xbox or Playstation.” Ex. 1005, 19:35-43; Ex. 1003,

¶ 309.⁴ Thomas further discloses storing profiles for “any participating user” that any other user can “download or access” to use in simulation mode on the same or a different video game console. *Id.*, 19:57-62; Ex. 1003, ¶ 310. Thus, a POSITA would have understood and it would have been obvious that the stored correlations, including at least first, second, and third correlations from one user’s profile can be used to operate an avatar on multiple user’s game consoles. Accordingly, when User A and User B both download the same profile for use in simulation mode, the correlations from that profile (including a third correlation) would be used to operate an avatar of another application (*e.g.*, User B’s application of the video game). Ex. 1003, ¶ 310-311.

c. **[14.3] wherein the third one or more object representations represent one or more objects of the another application.**

Thomas discloses limitation [14.3]. Ex. 1003, ¶ 312.

As explained above, when a second user (*e.g.*, User B) downloads a profile from the server to simulate another user’s control of the avatars for a particular team, the third one or more object representations stored in the user’s profile would

⁴ The ’134 Patent discloses examples of multiple application programs, including computer games, virtual world applications, and a web browser. Ex. 1001, 61:7-20; Ex. 1003, ¶ 309.

represent one or more objects of another application when implemented on User B's game console, such as the defensive players in the game on User B's game console.

Ex. 1003, ¶ 312; *see* Section IX.A.14.b *supra*.

- 15. Claim 15: The system of claim 1, wherein the first one or more instruction sets for operating the first avatar of the application include one or more information about one or more states of: the first avatar of the application or a portion of the first avatar of the application.**

Thomas discloses claim 15. Ex. 1003, ¶ 313.

Thomas describes that the instruction sets can include information about the state of the first avatar, such as the object's archetype, its kick profile (*i.e.*, the avatar's power to kick), whether the avatar possesses the ball (*e.g.*, for a pump fake), or the time remaining in the game in which the avatar is playing. *See* Ex. 1005, at 4:45-51, 4:29-31, 8:8-15, 12:42-54; Ex. 1003, ¶ 313.

- 16. Claim 16: The method system of claim 1, wherein: an element of the first correlation is deleted after the first correlation is generated, an element of the first correlation is modified after the first correlation is generated, an element of the first correlation is manipulated after the first correlation is generated, or an element is inserted into the first correlation after the first correlation is generated.**

Thomas discloses claim 16. Ex. 1003, ¶ 314-317.

In particular, Thomas describes that if “there is existing data in the playbook profile,” *i.e.* after the first correlation is generated, the simulator will “evaluate whether the data is up to date” and elements of the data should “evolve as the user's

interaction evolves. In other words, data recorded thirty games ago may have a lesser impact on the total data available.” Ex. 1005, 10:27-32; Ex. 1003, ¶ 315. Thomas further describes that for correlations comprising the same situation/event (*i.e.*, situations that have the same one or more object representations) correlated with different instruction sets, “each different type of user input” is “associate[d with] one or more values...based on the *statistical occurrence of each input* compared to other inputs.”” Ex. 1005, 6:13-27; *see id.* at 6:16-25 (“In one hundred (100) occurrences of the event, if the user spun left twenty (20) times, right thirty (30) times, and juked fifty (50) times, the simulator 120 will assign values of twenty (20), thirty (30), and fifty (50) to the respective responses.”); Ex. 1003, ¶ 316.

Accordingly, Thomas discloses that an element of the first correlation is modified and/or inserted after the first correlation is generated because the numerical weight is an element of the correlation that would be inserted into and/or modified/updated in the correlation each time the user provides the same response to the same situation/event, which would occur after the correlation is first generated. Ex. 1003, ¶ 317; *see also* Ex. 1001, 95:50-53 (specification describing that correlations can include “Extra Info”), *id.* 98:25-30 (“*Object Representations 525* representing Objects 615 in Avatar's 605 surrounding... *correlated with any Instruction Sets 526 and/or Extra Info 527.*”).

17. Claim 17

- a. [17.1] The system of claim 1, wherein the machine readable code, when executed by the one or more processors, causes the one or more processors to further perform at least: modifying: the first one or more instruction sets for operating the first avatar of the application, or a copy of the first one or more instruction sets for operating the first avatar of the application, and

Thomas discloses limitation [17.1]. Ex. 1003, ¶ 318-320.

Specifically, Thomas describes that the system evaluates whether the user's profile, which includes the correlations comprising instruction sets, is up to date after each game. Ex. 1005, 10:29-30 (“[D]ata should evolve as the user's interaction evolves. In other words, data recorded thirty games ago may have a lesser impact on the total data available.”). In one example, Thomas describes storing an instruction set for operating a kicker avatar in a football game. *Id.*, 12:42-46 (“[A] kick profile 420 stores information as to how well a user kicks the ball during play. This includes... the minimum and maximum distances that a user has kicked the ball, and the total power used.”); Ex. 1003, ¶ 318. Moreover, Thomas discloses that the system modifies the kick profile, including the instruction set comprising the kick distance/power range, when the system records data during learning mode associated with how the user performed the kicking function (e.g., the power used to kick). *Id.*, 12:47-51 (“When recording data for a kick profile 420, the simulator 120 may check to see if the user's power has exceeded the minimum or maximum, increment the

kick count, and *add the power to the total power accumulated.*”); Ex. 1003, ¶ 319-320.

- b. **[17.2] wherein the executing the first one or more instruction sets for operating the first avatar of the application includes executing: the modified the first one or more instruction sets for operating the first avatar of the application, or the modified the copy of the first one or more instruction sets for operating the first avatar of the application, and**

Thomas discloses limitation [17.2]. Ex. 1003, ¶ 321.

Thomas describes applying and executing the modified instruction set for kicking a football to the simulated kicker during simulation mode, which causes the kicker to kick the football based on the modified instruction set for kickoff, punts, and field goals. Ex. 1005, 12:51-54 (“[I]n simulation mode...and *the simulated user is in a kick situation, the simulator 120 may determine the power for kick based on the corresponding kick profile.*”).

- c. **[17.3] wherein the performing, by the first avatar of the application or by the second avatar of the application, the one or more operations defined by the first one or more instruction sets for operating the first avatar of the application includes performing, by the first avatar of the application or by the second avatar of the application, one or more operations defined by: the modified the first one or more instruction sets for operating the first avatar of the application, or the modified the copy of the first one or more instruction sets for operating the first avatar of the application.**

Thomas discloses limitation [17.3]. Ex. 1003, ¶ 322.

Thomas discloses that the performing by the first avatar of the application the one or more operations defined by the first one or more instruction sets for operating the first avatar of the application includes performing the modified the first one or more instruction sets for operating the first avatar of the application. As explained above, Thomas describes applying and executing the modified instruction set for kicking a football to the simulated kicker during simulation mode, which causes the kicker to kick the football (*i.e.*, performing the operations defined by the modified instruction set). *See supra* Section IX.A.17.b; Ex. 1003, ¶ 322.

18. Claim 18

- a. **[18.1] The system of claim 1, wherein at least a portion of the first correlation is learned in a learning process that includes: operating the first avatar of the application at least partially by: a human user, or a non-human user:**

Thomas discloses limitation [18.1]. *See* Section IX.A.11.d-e *supra*; Ex. 1003, ¶ 323.

- b. **[18.2] generating or receiving the first one or more object representations;**

Thomas discloses limitation [18.2]. Ex. 1003, ¶ 324.

As explained for claim 1, Thomas discloses this limitation because it describes that during learning mode, the system generates and stores (*i.e.*, receives) information concerning situations/events, including object representations of the

defensive players and their spatial position in a video game. *See* Section IX.A.1.c *supra*; Ex. 1003, ¶ 324.

- c. **[18.3] and obtaining or receiving the first one or more instruction sets for operating the first avatar of the application.**

Thomas discloses limitation [18.3]. Ex. 1003, ¶ 325.

As explained above for claim 1, Thomas also discloses that during learning mode the system stores (*i.e.*, obtains and receives) the user's commands (*i.e.*, instruction sets) associated with particular situations and/or events during the game. *See* IX.A.1.c *supra*; Ex. 1003, ¶ 325.

19. Claim 19

- a. **[19.1] A system comprising: a memory that stores at least a first correlation including a first one or more object representations correlated with a first one or more instruction sets for operating a first avatar of an application, wherein the first one or more object representations represent one or more objects of the application;**

Thomas discloses limitation [19.1]. *See* Section IX.A.1.b-c *supra*; Ex. 1003, ¶ 326.

- b. **[19.2] means for generating or receiving a second one or more object representations, wherein the second one or more object representations represent one or more objects of the application;**

Thomas discloses limitation [19.2]; Ex. 1003, ¶ 327.

As explained above, Thomas discloses the claimed function. *See* Section IX.A.1.d *supra*. Moreover, the corresponding structure for this limitation is one or more processors or processor circuits, which Thomas discloses performing the claimed function. *See* Section IX.A.1.a & IX.A.1.d *supra*; Ex. 1003, ¶ 327 (explaining that Claims 1-2 of Thomas confirm that the processor performs the generating or receiving functions).

- c. **[19.3] means for determining the first one or more instruction sets for operating the first avatar of the application based on at least partial match between the second one or more object representations and the first one or more object representations; and**

Thomas discloses limitation [19.3]. Ex. 1003, ¶ 328.

As explained above, Thomas discloses the claimed function. *See* Section IX.A.1.e *supra*. Moreover, the corresponding structure for this limitation is one or more processors or processor circuits, which Thomas discloses performing the claimed function. *See supra* IX.A.1.a & IX.A.1.e; Ex. 1003, ¶ 328 (explaining that Claims 1-2 of Thomas confirm that the processor performs the determining function).

- d. **[19.4] means for executing, at least in response to the determining, the first one or more instruction sets for operating the first avatar of the application, wherein the first avatar of the application or a second avatar of the application performs one or more operations defined by the first one or more instruction sets for operating the first avatar of the application.**

Thomas discloses limitation [19.4]. Ex. 1003, ¶ 329.

As explained above for claim 1, Thomas discloses the claimed executing function. *See* Section IX.A.1.f *supra*. Moreover, the corresponding structure for this limitation is one or more processors or processor circuits, which Thomas discloses performing the claimed function. *See* Section IX.A.1.a & IX.A.1.f *supra*; Ex. 1003, ¶ 329 (explaining that Claims 1-2 of Thomas confirm that the processor performs the executing function).

20. Claim 20

- a. **[20.1] The system of claim 19, wherein the means for generating or receiving the second one or more object representations includes one or more processors, and**
- b. **[20.2] wherein the means for determining the first one or more instruction sets for operating the first avatar of the application based on the at least partial match between the second one or more object representations and the first one or more object representations includes one or more processors, and**
- c. **[20.3] wherein the means for executing, at least in response to the determining, the first one or more instruction sets for operating the first avatar of the application includes one or more processors.**

Thomas discloses limitations [20.1], [20.2] and [20.3]. Ex. 1003 ¶ 330.

Claim 20 requires that each of the “means for generating or receiving,” means for determining,” and “means for executing” includes one or more processors. As explained for claim 19, Thomas discloses that one or more processors performs the generating/receiving, determining, and executing functions. *See* Section IX.A.19 *supra*.

B. Ground 3: Claims 1, 3, and 17 are Anticipated by Buehler

1. Claim 1

- a. **[1.1] A system comprising: one or more processors; and**

Buehler discloses a robot system comprising one or more processors. Ex. 1006, 4:51-56 (“The image processing module and the control system comprise sets of instructions stored in memory and executable by *a processor*.”), 8:10-15 (describing a robot system); Ex. 1003, ¶ 332.

- b. **[1.2] and one or more non-transitory machine readable media storing machine readable code that, when executed by the one or more processors, causes the one or more processors to perform at least:**

Buehler discloses a non-transitory machine readable media (*e.g.*, a hard disk, optical storage unit, and/or memory) that stores machine readable code (*i.e.*, sets of instructions) that, when executed by the one or more processors, causes the one or more processors to perform various functions. Ex. 1006, 10:5-14 (“[T]he robot controller and high-level computational functionality are implemented on a general-purpose computer 210...include[ing] a central processing unit (CPU) 222...system

*memory 224, and non-volatile mass storage devices (such as one or more hard disks and/or optical storage units) 226.”), 4:51-56 (“The image processing module and the control system comprise *sets of instructions stored in memory and executable by a processor.*”), 12:21-25 (describing that robot-user interaction is “controlled and processed by associated ***program code***”); Ex. 1003, ¶ 333-334.*

- c. **[1.3] accessing a first correlation including a first one or more object representations correlated with a first one or more instruction sets for operating a first avatar of an application, wherein the first one or more object representations represent one or more objects of the application;**

Buehler discloses limitation [1.3]. Ex.1003, ¶ 335-336.

Buehler describes a memory that stores representations of objects (*i.e.*, template images) correlated with instruction sets (*e.g.*, a routine for picking up the object) for operating a robot and its end effector:

The method includes...using a visual model to computationally *identify the object based on a stored representation thereof* associated with the model, determining whether *an object specific manipulation routine is stored in association with the stored representation*, and, if so, executing the object-specific manipulation routine.

Ex. 1006, 7:6-15; Ex.1003, ¶ 335.

The “stored representations” and “template images” disclosed in Buehler are object representations representing one or more objects of the application because they represent images that the robot may encounter, which the system application

matches with new images captured by the robot to determine an instruction set for operating an avatar of the robot in a virtual representation, such as performing a task on the object in the virtual representation:

In this method, the robot...overlays a representation of an end-effector onto the camera view, and displays performance of an action on the object by the end-effector.... In some embodiments, the robot selects the action from a plurality of stored action templates.

Ex. 1006, 6:31-48.

[T]he robot may overlay virtual grippers on the image... to indicate where the grasp point would be.... Thus,... the robot can give the user a sense of the likelihood of a successful pick-up.

Ex. 1006, 21:46-54; Ex. 1003, ¶ 336. Buehler also discloses that the instruction sets correlated to the representations of object can be learned during training procedures that involve a user partially operating the device. *See* Section IX.B.3 *infra*.

d. **[1.4] generating or receiving a second one or more object representations, wherein the second one or more object representations represent one or more objects of the application;**

Buehler discloses limitation [1.4]. Ex. 1003, ¶ 337.

Buehler discloses receiving and generating a second one or more object representations that represent one or more objects of the application. In particular, Buehler describes generating an object representation of an object that the robot receives with its camera (*i.e.* a second object representation that represents an object

of the application), which the robot displays in an image with a virtual representation of the robot's end-effector (*e.g.*, grippers) in a simulation:

For example, the *robot may use a camera to acquire images of its environment (constituting real-world data), and overlay computer graphics onto the image (such as... a representation of the robot's end-effector, indicating the position of the end-effector relative to the object).*

Ex. 1006, 2:6-12; *id* at 21:47-50 (“The robot may overlay *virtual grippers on the image (or video stream) of the object to indicate where the grasp point would be, given the current arm location and orientation (step 606).*”).

- e. **[1.5] determining the first one or more instruction sets for operating the first avatar of the application based on at least partial match between the second one or more object representations and the first one or more object representations; and**

Buehler discloses limitation [1.5]. Ex. 1003, ¶ 338-339.

Buehler discloses determining the first one or more instruction sets for operating the first avatar of the application based on at least a partial match between the second one or more object representations and the first one or more object representations. In particular, Buehler describes comparing newly captured images (*i.e.*, a second object representation) with previously stored template images of an object (*i.e.*, a first object representation), and determining an object specific routine for operating the robot (*i.e.*, an instruction set) upon detecting a match:

The method includes...*using a visual model to computationally identify the object based on a stored representation thereof associated with the model, determining whether an object specific manipulation routine is stored in association with the stored representation, and, if so, executing the object-specific manipulation routine.*

Ex. 1006 ,7:6-15; *id.* at 18:50-54 (“The detection algorithm 508 *compares real-time camera images against the template* and determines, based on a similarity metric, whether the realtime image contains the object of interest.”); Ex. 1003, ¶ 338.

Buehler further describes that when the system detects a match between the images (*i.e.*, the object representations), it determines an instruction set for operating the visual representation of the robot (*i.e.*, the first avatar of the application) to simulate how the robot would attempt to grasp the object in the newly captured image (*i.e.*, the second object representation):

Following the user's *approval of the selected visual model*, the robot may overlay *virtual grippers on the image (or video stream) of the object to indicate where the grasp point would be....* [T]he robot can give the user *a sense of the likelihood of a successful pick-up.*

Ex. 1006, 21:46-54; Ex. 1003, ¶ 339.

- f. **[1.6] at least in response to the determining, causing the first avatar of the application or a second avatar of the application to perform one or more operations defined by the first one or more instruction sets for operating the first avatar of the application at least by executing the first one or more instruction sets for operating the first avatar of the application.**

Buehler discloses limitation [1.6]. Ex. 1003, ¶ 340.

In particular, Buehler describes that when the system detects a match of object representations and determines the instruction set, the system executes the instruction set for operating the first avatar (*i.e.*, the virtual robot and its end effector), which causes the virtual robot to perform the operations defined by the instruction set in the simulation application:

Once the robot has received the user's confirmation, *it may analyze the pixels corresponding to the object and selects a suitable visual representation and algorithm to reliably detect and localize the object....*

[T]he robot may overlay virtual grippers on the image (or video stream) of the object to indicate where the grasp point would be, given the current arm location and orientation....

Ex. 1006, 21:33-50; *see also id.* at 6:31-37 (“[T]he robot selects an object in the field of view..., *overlays a representation of an end-effector onto the camera view, and displays performance of an action on the object by the end-effector....*”); 7:6-15; Ex. 1003, ¶ 340.

2. Claim 3

- a. **[3.1] The system of claim 1, wherein the determining the first one or more instruction sets for operating the first avatar of the application based on the at least partial match between the second one or more object representations and the first one or more object representations includes:**

Buehler discloses limitation [3.1]. *See* Section IX.B.1.e *supra*; Ex. 1003, ¶ 341.

- b. **[3.2] determining that a number of at least partially matching portions of the second one or more object representations and portions of the first one or more object representations exceeds a threshold number, or determining that a percentage of at least partially matching portions of the second one or more object representations and portions of the first one or more object representations exceeds a threshold percentage.**

Buehler discloses limitation [3.2]. Ex. 1003, ¶ 342-344.

The '134 Patent specification describes that the threshold number or percentage can be any number. *See* Ex. 1001, 115:2-7 (“In another example, substantial similarity can be achieved when at least a threshold number (i.e. 1, 2, 3, 6, 11, etc.) or percentage (i.e. 55%, 61%, 78%, 82%, 99%, etc.)....”); Ex. 1003, ¶ 342. Buehler discloses determining that a number of at least partially matching portions exceeds a threshold number or percentage. In particular, Buehler describes that when its system matches newly captured images to stored template images (*i.e.*, comparing first and second object representations), the system uses a threshold

metric or score (*i.e.*, a threshold number) to assess whether there is a match. *See* Ex. 1006, 18:3-7 (“The learning algorithm may also provide an *error metric or confidence metric* that indicate how closely the object can be fitted with an ellipse. In general, *if the error exceeds a specified threshold, the representation is deemed invalid....*”); 18:54-57 (“[T]he detection algorithm may run a normalized *cross-correlation of the stored image template with a presently acquired image*, resulting in a score for each pixel. *Scores above a set threshold....*”); Ex. 1003, ¶ 343-344.

3. Claim 17

- a. **[17.1] The system of claim 1, wherein the machine readable code, when executed by the one or more processors, causes the one or more processors to further perform at least: modifying: the first one or more instruction sets for operating the first avatar of the application, or a copy of the first one or more instruction sets for operating the first avatar of the application, and**

Buehler discloses limitation [17.1]. Ex. 1003, ¶ 345.

Buehler discloses that the one or more processors modify the first one or more instruction sets for operating the first avatar of the application. In particular, Buehler describes that during training mode, the user and/or robotic system can modify the instruction set for operating the virtual robot and its end effector by adjusting the routine after the system simulates performance of the task:

If the virtual gripper is not positioned around the proper part of the object...*the user may adjust the arm* to roughly establish the proper

grasp point (step 610).... *This process of coarse and fine adjustments of the gripper by the human trainer and the robot, respectively, may be iterated until the user is satisfied with the grasp point and gripper orientation shown in the visual display.*

Ex. 1006, 21:54-64; *see also id.* 22:26-32 (“[T]he routines may be programmed into the robot at the outset and altered...during training....”)

- b. **[17.2] wherein the executing the first one or more instruction sets for operating the first avatar of the application includes executing: the modified the first one or more instruction sets for operating the first avatar of the application, or the modified the copy of the first one or more instruction sets for operating the first avatar of the application, and**

Buehler discloses limitation [17.2]. Ex. 1003, ¶ 346.

Buehler describes that after the user and/or system adjusts the execution routine (i.e., instruction set) during training mode, the system executes and the virtual end effector performs the modified instruction set to demonstrate performance of the task. Ex. 1006, 6:37-43 (“Based on the display, feedback is provided.... *The display of the robot's performance of the action on the object by the end-effector and feedback are repeated until the action is performed correctly on the display.*”).

- c. [17.3] wherein the performing, by the first avatar of the application or by the second avatar of the application, the one or more operations defined by the first one or more instruction sets for operating the first avatar of the application includes performing, by the first avatar of the application or by the second avatar of the application, one or more operations defined by: the modified the first one or more instruction sets for operating the first avatar of the application, or the modified the copy of the first one or more instruction sets for operating the first avatar of the application.

Buehler discloses limitation [17.3]. Ex. 1003, ¶ 347.

As explained above for limitations [17.1] and [17.2], Buehler discloses that the system executes and the virtual robot (*i.e.*, the first avatar) performs the modified instruction set after it is updated by the user and/or system, and therefore performs the modified the first one or more instruction sets for operating the first avatar of the application. Ex. 1003, ¶ 347.

X. CONCLUSION

For the foregoing reasons, review should be instituted and claims 1-20 of the '134 Patent should be cancelled as unpatentable.

Dated: June 30, 2023

Respectfully submitted,

/Anish R. Desai/

Anish R. Desai

Lead Counsel for Petitioner

Registration No. 73,760

Weil, Gotshal & Manges LLP

767 Fifth Ave.

New York, NY 10153

T: 212-310-8000

F: 212-310-8007

CERTIFICATE OF COMPLIANCE

1. The undersigned certifies that this brief complies with the type volume limitations of 37 CFR § 42.24(a)(1)(i). This brief contains 13,996 words (excluding the table of contents, the table of authorities, mandatory notices under 37 CFR § 42.8, the certificate of service, certificate of compliance, and appendix of exhibits), as calculated by the “Word Count” feature of Microsoft Word 2016, the word processing program used to create it.

2. The undersigned further certifies that this brief complies with the typeface requirements of 37 CFR § 42.6(a)(2)(ii) and typestyle requirements of 37 CFR § 42.6(a)(2)(iii). This brief has been prepared in a proportionally spaced typeface using Microsoft Word 2016 in Times New Roman 14 point font.

Dated: June 30, 2023

Respectfully submitted,

/Anish R. Desai/

Anish R. Desai

Lead Counsel for Petitioner

Registration No. 73,760

Weil, Gotshal & Manges LLP

767 Fifth Ave.

New York, NY 10153

T: 212-310-8000

F: 212-310-8007

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.105 and § 42.6(e), the undersigned certifies that on June 30, 2023, a complete and entire copy of this **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,607,134, PETITIONER TESLA, INC.'S POWER OF ATTORNEY, and all supporting exhibits** were sent via FedEx next business day delivery to the following:

Jasmin Cosic
Autonomous Devices LLC
2271 Myla Lane
Melbourne, FL 32935

/ Timothy J. Andersen/
Timothy J. Andersen
Case Manager
Weil, Gotshal & Manges LLP
2001 M Street, N.W., Suite 600
Washington, D.C. 20036
202-682-7000
timothy.andersen@weil.com