

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Jasmin Cosic
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Title: ARTIFICIALLY INTELLIGENT SYSTEMS, DEVICES, AND
METHODS FOR LEARNING AND/OR USING AN AVATAR'S
CIRCUMSTANCES FOR AUTONOMOUS AVATAR
OPERATION

SUPPLEMENTAL DECLARATION OF DR. JASON JANET

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I. INTRODUCTION

1. I have been retained as a technical expert by counsel on behalf of Tesla, Inc. (“**Tesla**”/“**Petitioner**”) in Case No. IPR2023-01169 with respect to U.S. Patent No. 10,607,134 (“**the ’134 patent**”) (TESLA-1001).

2. I understand that this declaration (“**Supplemental Declaration**”) will be submitted in support of Petitioner’s Reply to Patent Owner’s Response (“**POR**”) to the Petition for *inter partes* review of the ’134 patent. This Supplemental Declaration supplements certain portions of my prior declaration in support of the Petition for this IPR Proceeding (TESLA-1003, “**my Prior Declaration**”). In my Prior Declaration, I address many topics, including (but not limited to) my background and qualifications, the level of skill in art, an overview of the ’134 patent, a POSITA’s background knowledge, certain legal standards explained to me by counsel, legal principles applied for the purposes of my analysis and this declaration, and a detailed analysis of the prior art against the claim elements of the ’134 patent.

3. I maintain all of my earlier analysis and continue to hold the opinions expressed in my Prior Declaration. This Supplemental Declaration does not replace my Prior Declaration. These declarations are complementary and should be read in tandem. Accordingly, this Supplemental Declaration does not cover every topic addressed in my Prior Declaration.

4. In forming this Supplemental Declaration, I have considered, among various documents, the following: the declaration of Patent Owner (PO)'s declarant, Dr. Saber (EX2007), the Board's institution decision (Paper 19), my knowledge and experience in this field, including my research, and work experience in the field, my experience working with others involved in the field, and the third-party documents cited throughout my analysis. *See* TESLA-1003, ¶¶5-20 (discussing qualifications) and ¶¶22-36 (discussing legal standards and the level of skill for a "POSITA"). I have also considered the following additional references:

- TESLA-1023 Transcript of Dr. Eli Saber Deposition in the current proceeding
- TESLA-1025 U.S. Patent No. 7,399,224 ("Hirai")
- TESLA-1026 Merriam-Webster's Collegiate Dictionary, Eleventh Edition (2014)
- TESLA-1027 "ESPN NFL 2K5 Review" available at <https://www.gamespot.com/reviews/espn-nfl-2k5-review/1900-6103135/>

5. Although I cite and quote to selected portions of various references in this Declaration, the reader should understand that these citations are representative examples. A POSITA would have viewed each reference in its entirety and in combination with other references. Accordingly, I intend the references identified

in this Declaration to be viewed as incorporated in their entireties. I am not, and never have been, an employee of Tesla. I received no compensation for this Supplemental Declaration beyond my normal hourly compensation based on my time actually spent analyzing the '134 Patent, the prior art publications cited below, and various issues related thereto. I will not receive any added compensation based on the outcome of any IPR or other proceeding involving the '134 Patent.

6. The analysis and opinions expressed in my Prior Declaration fully explain why: [1] each and every feature of the '134 Patent's claims is provided in the prior art; and [2] a POSITA would have been motivated to combine the known prior art elements in a manner that reaches the claimed invention. Patent Owner's expert, Dr. Saber, has considered my opinions and offered his own, some of which are inconsistent with my view. I will address certain points of dispute below. The fact that I may have not addressed all of Dr. Saber's opinions should not be interpreted as agreement with them.

II. GROUNDS 1 AND 2: THOMAS ANTICIPATES OR RENDERS OBVIOUS THE CHALLENGED CLAIMS

A. Claims 1, 10, and 19

7. Claim 1 recites, among other things, the following limitation (I have added the highlighting for emphasis):

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

8. PO presents only a single argument against the Ground 1 challenge of claim 1¹—that “analysis” (which is the word used in portions of Thomas that I cited with respect to this feature) “is different than matching.” POR, 14-19. I disagree with this position, and I believe that it is flawed at least because it is based on an incomplete consideration of the full scope and context of the disclosures of Thomas that I cited in my Prior Declaration. *See* TESLA-1003, ¶¶241-242. As I described in my Prior Declaration, and as I explain further here, a POSITA would have understood the operation of Thomas’s playback mode to be based on a **match** between current circumstances and circumstances previously recorded during learning mode, *e.g.*, a **match** between object representations.

¹ Similar arguments apply to independent claims 10 and 19.

9. In my Prior Declaration, I explained that in operation, Thomas's system analyzes situations that occur during playback mode and identifies similar situations that were recorded during learning mode, in order to invoke the appropriate simulated input responsive to each playback mode situation. *See* TESLA-1005 (Thomas), 5:27-36; TESLA-1003, ¶¶241-242. A situation is "defined by a set of one or more parameters," at least some of which characterize objects of the application (*e.g.*, parameters specifying locations or archetypes of avatars). TESLA-1005 (Thomas), 4:13-59. That is, each situation is defined (at least in part) by object representations (*e.g.*, including parameter values) characterizing objects that form part of the situation. *See* TESLA-1003, ¶¶233-236, 241-242. With this context, a POSITA would have understood that Thomas's identification of situations that are similar to a situation encountered in playback mode involves identifying situations recorded during learning mode that have at least some similar parameter values, *e.g.*, situations with a **match** between object representations. TESLA-1003, ¶¶241-242.

10. A concrete example of Thomas's reliance on a **match** between object representations is apparent in the context of the "pump fake event" that I discussed in my Prior Declaration. *See* TESLA-1003, ¶¶241-242; TESLA-1005 (Thomas), 8:8-15. In this example, in learning mode, the simulator "records how covered the user was," *i.e.*, records parameters specifying locations of opposing-team players

(first object representations; *see* TESLA-1003, ¶¶232-236). TESLA-1005 (Thomas), 8:8-11. Later, in playback mode, the simulator “analyze[s] the location of ... the defensive coverage,” *i.e.*, again, locations of opposing-team players (second object representations; *see* TESLA-1003, ¶¶237-240). “If criteria is met,” the simulator “invoke[s] a pump fake.” TESLA-1005 (Thomas), 8:8-15; *see* TESLA-1003, ¶¶241-242.

11. Patent Owner asserts that the term “‘analyze’ in this citation ... is a different concept than ‘matching.’” POR, 16. But this is not a reasonable distinction. The question of whether “criteria is met,” in the context of analyzing defensive coverage to determine whether to invoke a pump fake action, is based on whether there is a match between the locations of the opposing-team players in the learning mode and playback mode situations, *i.e.*, a ***match*** between first object representations (player positions in learning mode) and second object representations (player positions in playback mode). *See* TESLA-1003, ¶¶241-242.

12. Thomas’s “pass out of shot event” example is even more clear in its indication that Thomas’s system considers whether there is a ***match*** between object representations defining a situation in learning mode and object representations defining a situation occurring during playback mode. TESLA-1005 (Thomas), 7:55-64. As in the pump fake example I discussed, in learning mode, the system

“records how open the receiving avatar was and how covered the passing avatar was,” *i.e.*, records parameters indicating locations of opposing-team avatars (first object representations) in the vicinity of the receiving and passing avatars.

TESLA-1005 (Thomas), 7:55-59. Later, in playback mode, the locations of opposing-team avatars (second object representations) are again considered: “the simulator 120 will analyze how well the passing avatar and the receiving avatar are covered.” *Id.*, 7:59-61. Just as in the pump fake example, “if the current circumstances meet the criteria,” a pass is invoked, where the criteria are “how much the passing and receiving avatars are covered.” *Id.*, 7:62-64. A POSITA would have understood that the question of whether “current circumstances meet the criteria” in terms of “how much the passing and receiving avatars are covered”—*i.e.*, the locations of opposing-team avatars—is based on whether there is a *match* between locations of opposing-team avatars in the playback mode situation and locations of opposing-team avatars in a learning mode situation in which a pass was invoked. *See* TESLA-1003, ¶¶241-242.

B. Claim 3

13. Claim 3 recites the following language:

3. 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:

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.

14. According to Patent Owner, claim 3 requires “counting the portions and determining whether this counted number of portions exceeds a numerical threshold,” or “counting the portions to compute the percentage and determining whether this computed percentage of portions exceeds a percentage threshold.”

POR, 22. This argument is wrong.

15. To start, Patent Owner’s argument relies on terms such as “counting” that are nowhere to be found in the language of claim 5. The plain language of claim 5 simply requires “determining *that* a number [or percentage] of at least partially matching portions” exceeds a threshold number or percentage. Such a determination can be performed with or without counting. For instance, counting is indeed one way to determine a number of items, but it is not the only way. Another way is to estimate the number of items. Still another way is to calculate

the number of items. For instance, if the number of items is indicated by an equation, solving the equation can give the number of items without requiring counting. As another example of calculating, there may be multiple subgroups of the items, each with a known quantity of the items, and the total number of items can be determined by adding up the number of items in each subgroup. Patent Owner's implicitly narrow construction is inconsistent with the claim language, is supported by neither intrinsic nor extrinsic evidence, and should be rejected.

16. As I explained in my Prior Declaration, Thomas discloses determining that a number/percentage of matching portions exceeds a threshold. *See* TESLA-1003, ¶¶250-251. For instance, in the pass out of shot example, a pass is invoked “if the current circumstances meet the criteria, e.g., how much the passing and receiving avatars are covered.” TESLA-1005 (Thomas), 7:62-64. A POSITA would have understood that “how much” an avatar is covered refers to how many opposing-team players are within the vicinity of that avatar. A POSITA further would have understood that determining whether that coverage “meet[s] the criteria” is a threshold question of whether the passing and/or receiving avatars are open or covered enough to justify invoking a pass action. That is, the question when deciding whether to invoke a pass is whether the number of opposing-team players within the vicinity of the passing and/or receiving avatars *exceeds a threshold* to warrant invoking the pass.

17. A POSITA would have reached a similar understanding regarding the “criteria” for the “defensive coverage” in Thomas’s pump fake example, which similarly looks at whether “criteria is met” in relation to “the defensive coverage” of the simulated user when deciding whether to invoke a pump fake event. *See* TESLA-1005 (Thomas), 8:8-15. That is, whether to invoke a pump fake involves determining whether the number of opposing team players within the vicinity of the simulated user exceeds a threshold.

18. Alternatively/additionally, to the extent this threshold feature is not expressly disclosed by Thomas, I argued in my Prior Declaration that “it would have been obvious to use a threshold number or percentage to determine whether the criteria ... is met.” This would have been obvious at least because that is one way of implementing a determination of whether “how much the avatars are covered” satisfies criteria, as specified by Thomas. TESLA-1003, ¶¶250-251.

C. Claim 4

19. Patent Owner seeks to distinguish the claimed features over Thomas by advancing a narrow construction of the term “connection.” Specifically, Patent Owner contends that “a ‘connection’ should be construed as a ‘relationship that includes a link.’” POR, 10. I disagree.

20. Nothing in the specification, file history, or extrinsic evidence supports importing a requirement for a “connection” to include a “link” as

proposed in the POR. And while it is clear that Thomas discloses the claimed first and second connections under a plain meaning interpretation of “connection,” Thomas still discloses the claimed features even under Patent Owner’s improper construction.

1. PO’s overly narrow construction of “connection” should be rejected

21. I have been informed by Petitioner’s Counsel that the relevant inquiry in assessing whether to narrow claims and depart from plain meaning is whether the specification, with sufficient clarity and deliberateness, reflects lexicography or disavowal that warrants a narrowing of the plain and ordinary meaning of the disputed claim phrase to require the additional narrowing features. Here, the ’134 Patent includes no lexicography or disavowal to support Patent Owner’s construction of “connections” and the POR does not even attempt to demonstrate lexicography or disavowal.

22. PO instead attempts to import a requirement for a connection” to include a “link” by mere reference to *examples* in the specification where a “link” is disclosed. EX2007, ¶¶____; POR, 10. For example, PO turns to FIGS. 16 and 17A, which are described as “embodiments.” Counsel for Petitioner has indicated to me that the word “embodiments” does not impose a limiting effect. TESLA-1001, 56:29-34. The ’134 Patent explains that Model A in FIG. 16 “*may* include a network of Nodes 852 ... and Connections 853 similar to that of a brain.” TESLA-

1001, 105:21-23. In FIG. 17A, “[e]ach of Connection 853zl and Connection 853z2 *may* include or be associated with occurrence count, weight, *and/or other parameters or data.*” TESLA-1001, 107:50-53. The ’134 patent also states that a “connection *may include or be associated* with at least one of: an occurrence count, a weight, a parameter, or a data.” TESLA-1001, 16:8-10. These descriptions include a permissive “may,” and do not necessarily limit the scope of a claim term.

23. Notably, the textual description of FIGS. 16 and 17A does not once use the word “link,” which PO seeks to import into the construction of “connection.” The specification also broadly describes “connections”—both “direct” and otherwise—at col. 66:12-32 without ever referring to or mandating that a connection include a “link” as proposed by PO. TESLA-1001, 66:12-32.

24. In addition to the lack of support, PO’s construction is problematic because PO’s construction includes the term “link”—the meaning of which is unclear and undefined by the ’134 Patent.

25. PO cites two dictionary definitions (EX2012, EX2013) as allegedly supporting its construction, each of which provides numerous definitions for “connection.” POR, 13. Patent Owner chose a definition that includes the word “link” but did not include any explanation for why it chose this definition from the various other available definitions, *particularly when the description in the ’134*

Patent does not even use the word “link” to describe a “connection.” Even if a connection may include a link in some contexts, there is no basis in the specification, file history, or otherwise for limiting a connection to a “relationship that includes a link” as Patent Owner contends.

26. Indeed, based on the broad description of the term “connection” in the ’134 Patent (*see e.g.*, TESLA-1001, 16:8-10, 66:12-32), no construction of “connection” is necessary because the plain and ordinary meaning is used in the ’134 Patent and should be applied for understanding the claims as well. As shown in the dictionaries relied on by the Patent Owner, the plain and ordinary meaning of “connection” encompasses “an association or a relationship,” which is also consistent with the description of connection, explicitly provided by the ’134 Patent. EX2012, 399-400, EX2013, 481; TESLA-1001, 16:8-10, 66:12-32. Thus, when two nodes or points of data have a connection, like in FIGS. 16 and 17A of the ’134 Patent, an “association or relationship” between the nodes or points of data provides a “connection.”

2. Thomas discloses the “connection[s]” of claim 4

27. Claim 4 recites the following language:

4. 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, the second avatar of the application, a third avatar of the application, or an avatar of another application, and wherein the third one or more object representations represent one or more objects of: the application, or the another application, and wherein the first correlation is connected with the third correlation by a connection.

28. As a preliminary matter, because Patent Owner's arguments on claim 4 are dependent on Patent Owner's faulty construction of "connection," Patent Owner's arguments with respect to claim 4 fail.

29. Yet, even if Patent Owner's construction is applied, Thomas still discloses the claimed connections. As I explained in my Prior Declaration, Thomas describes correlations each including a different instruction set for the same situation/event, where numerical weights are assigned to the correlations to indicate the frequency of occurrence of the action corresponding to each instruction set. *See* TESLA-1003, ¶¶255-256, 258-260; TESLA-1005 (Thomas), 6:19-30. Because these frequency weights establish an association or relationship between the stored data, *e.g.*, indicative of frequency of occurrence of each of multiple options correlated to the same situation/event, Thomas discloses the claimed "connection" between correlations. *See* TESLA-1003, ¶¶258-260.

30. Moreover, a POSITA would have understood Thomas's occurrence weights to link the various instruction sets that are correlated to a common situation/event. Thomas describes that during playback mode, "the simulator 120 can randomly invoke a response to a situation and/or event based on weighted statistical values of the stored inputs." TESLA-1005 (Thomas), 6:28-30. The relationship among the various "stored inputs" (*e.g.*, as represented by the instruction sets of the correlations) that enables a statistically weighted selection of an action is embodied by the numerical weights, *i.e.*, by the link between different instruction sets correlated to the same situation/event.

D. Claim 7

31. Claim 7 recites the following language:

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.

32. Patent Owner's arguments focus on this idea of temporal correspondence, and in particular on an attempt to frame claim 7 as relating to "a situation where a stream of object representations and a stream of instruction sets are first stored and ... correlated later, and where a determination of temporal

correspondence is needed for correct correlation.” POR, 27. Because “[n]o such situation ... is suggested in Thomas,” PO argues, Thomas cannot disclose the features of claim 7. *Id.*, 28. It is my understanding that as long as Thomas discloses the features that are actually required by the claim, it anticipates the claim—that is, Patent Owner’s arguments about the context (even if true) are not relevant. I explain here in more detail why Thomas does disclose all of the features of the claim, with reference also to the explanation I provided in my Prior Declaration. *See* TESLA-1003, ¶¶269-271.

33. Claim 7 merely recites “determining” that first instruction sets “temporally correspond” to first object representations, and says nothing about streams of object representations or instruction sets. Thomas discloses this determination of a temporal correspondence. As I explained in my Prior Declaration, in Thomas, an instruction set (*e.g.*, an instruction to invoke a pump fake) ***temporally corresponds*** to the object representations that define the event/situation (*e.g.*, locations of opposing-team avatars) at the time when the user input represented by that instruction set was received. *See* TESLA-1005 (Thomas), 7:55-59, 8:8-15; TESLA-1003, ¶¶269-271. That is, if a particular arrangement of defensive avatars (Thomas’s “defensive coverage”) was in place when the user pump faked in learning mode, the object representations

representing the defensive avatars in that arrangement would *temporally correspond* to the instruction to pump fake.

34. A POSITA would have understood that this temporal correspondence is *determined* in Thomas. Most fundamentally, Thomas's system identifies (*e.g.*, *determines*) the current circumstances (defined at least in part by object representations, *e.g.*, by the arrangement of the defensive avatars) when it receives a user input (instruction sets, *e.g.*, a user input to pump fake). *See* TESLA-1005 (Thomas), 7:55-50, 8:8-15; TESLA-1003, ¶¶269-271. Moreover, this *determination* is made in order *to correlate* the object representations with the instruction sets, *e.g.*, to “associate [*correlate*] the one or more data fields” storing user inputs (instruction sets) “with the one or more events and the one or more current circumstances.” TESLA-1005 (Thomas), Abstract.

E. Claim 12

35. Claim 12 recites the following language:

12. 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 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 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.

36. As I explained in my Prior Declaration, Thomas allows “any participating users” to “upload its own user profile for access by any other participating user” and to “download or access any user profile available in the database.” TESLA-1005 (Thomas), 19:57-62; *see* TESLA-1003, ¶¶296-297. Patent Owner argues that these interactions are “a different concept than learning at least a portion of the third correlation in another learning process involving operation of the first avatar by another user.” POR, 29.

37. I believe that Patent Owner’s interpretation fails to take into account what a POSITA would have understood from the cited portion of Thomas’s disclosure. Specifically, the ability that Thomas provides to its users to “upload”

user profiles or to “download or access any user profile” is described in the context of “learning *and/or* simulation mode.” TESLA-1005 (Thomas), 19:55-60. A POSITA thus would have understood Thomas’s disclosure of another user accessing a first user’s profile to encompass that other user accessing the first profile in learning mode, and thus that other user operating the first user’s avatar in learning mode. The correlations between object representations and instruction sets are learned during learning mode, as I have previously discussed. *See* TESLA-1005 (Thomas), 3:53-61, 4:62-5:13, 9:43-45, 11:25-26; TESLA-1003, ¶¶232-236. Thus, a POSITA would have understood that when a correlation is learned in learning mode when the other user is operating the first user’s avatar, that correlation is learned in a learning process *that includes operating the first avatar by another user*, as recited in claim 12. Moreover, the ability to “upload” a profile in the context of “learning *and/or* simulation mode” further indicates that “any participating user” may have the opportunity to train the profile of another user. TESLA-1005 (Thomas), 19:55-62.

F. Claim 14

38. Claim 14 recites the following language:

14. 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 an avatar of another application,** and wherein the third one or more object representations represent one or more objects **of the another application.**

39. In addressing claim 14, Patent Owner appears to be attempting to read this claim as requiring that the third correlation be “learned ... involving a different application.” POR, 32. This is not what the claim says and thus this is not a feature that needs to be met by Thomas. I note that the claim language (reproduced above) says nothing about where the third correlation was learned. Instead, it says only that the instruction sets of the third correlation are for “operating an avatar of another application,” and that the object representations “represent one or more objects of the another application.”

40. Under a proper interpretation of claim 14, Thomas does disclose the claimed third correlation, as I previously explained in my Prior Declaration. TESLA-1003, ¶¶308-312. To explain further, Thomas describes that the user can play games on different “video game console[s].” Thomas, 19:35-42. In this context, Thomas’s instruction sets are for operating an avatar in one application (*e.g.*, an instance of a basketball video game on “an Xbox”) *or* for operating an avatar in another application (*e.g.*, a different instance of the game on a

“Playstation”). TESLA-1005 (Thomas), 19:35-42. The Xbox instance of the game and the Playstation instance of the game are different applications and the instruction sets that are executed in, say, the Xbox instance are thus “instruction sets for operating an avatar of an application,” while the instruction sets that are executed in the Playstation instance are instead “instruction sets for operating an avatar of another application,” as claimed. Similarly, the object representations likewise represent objects in, *e.g.*, an Xbox instantiation (“an application”) or a Playstation instantiation (“another application”) of the game. TESLA-1003, ¶¶308-312. For example, instances of the game running on different consoles can be considered different applications because, *e.g.*, the game must be adapted to the specific instruction set architectures, constraints, and interfaces of the respective consoles.

G. Claim 16

41. Claim 16 recites the following language:

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.

42. In my Prior Declaration, I identified Thomas's statistical values/weights as corresponding to the claimed "element of the first correlation" that is, *e.g.*, modified. TESLA-1003, ¶¶314-317. Patent Owner's argument with respect to this claim is that "the only elements of the first correlation are the first instruction set and the first object representation," and thus Thomas's values/weights cannot be part of the first correlation. POR, 34.

43. Claim 1 (from which claim 16 depends) recites "a first correlation *including* a first one or more object representations correlated with a first one or more instruction sets." (emphasis added). I have been informed by Petitioner's counsel that the term "including" is an open-ended phrase, and thus PO's assertion that the first correlation cannot include further elements is simply not accurate. With that understanding, I stand by my statements in my Prior Declaration regarding Thomas's statistical values/weights as applied to claim 16.

H. Claim 17

44. Claim 17 recites, in part, the following language:

17. 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 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

45. Patent Owner's arguments with respect to this claim appear to be an attempt to read a temporal limitation into claim 17: they state that "the modifying recited in claim 17 is of instruction sets that are already correlated with object representations (i.e. after they are learned or stored...)." POR, 36. But I do not see any such requirement in the plain language of the claim, which merely recites "modifying: the first one or more instruction sets." Without this unjustified temporal requirement, I stand by the analysis in my Prior Declaration that, *e.g.*, Thomas's disclosure of "modif[ying] the kick profile" during learning mode corresponds to the claimed modifying of the one or more instruction sets. TESLA-1003, ¶¶318-322.

III. GROUND 3: BUEHLER ANTICIPATES CLAIMS 1, 3, AND 17

A. Claim 1

46. PO presents two distinct arguments against the Buehler-based challenge to claim 1. *See* POR, 50-54. I address each of these arguments in turn.

1. The objects acted upon by Buehler’s virtual grippers are “objects of the application”

47. Claim 1 recites, in part, the following language:

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;
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;

As I explained in my Prior Declaration, the physical object that Buehler’s robot is picking up corresponds to an object of the application, and the real-time image of that object corresponds to an object representation. Patent Owner argues that “the object ... that is operated on by Buehler’s virtual gripper is a physical object and not an object of the application.” POR, 51. But this is inconsistent with what constitutes Buehler’s “application.”

48. Buehler's robot training system implements an "augmented reality" application that encompasses "real-world data (or the real world itself) augmented with computer-generated data." TESLA-1006, 2:4-5; *see* TESLA-1003, ¶¶335-337. That is, both real-world objects (*e.g.*, the physical objects operated on by Buehler's virtual grippers) and computer-generated data (*e.g.*, Buehler's virtual grippers) constitute aspects of Buehler's augmented reality application.

49. Indeed, Buehler is explicit that real-world objects are part of its augmented reality application in its description of visual display of a task "in an augmented-reality display," where "the robot overlays computer-generated graphics ... *onto the real-world*." TESLA-1006, 3:59-62. Going beyond displays, Buehler even describes that interactions with real-world objects are within the scope of its augmented reality application: "visual augmented reality need not necessarily use camera images. Instead, the robot may place optical signals into the real world itself," *e.g.*, by "shin[ing] a laser pointer at the object" "to communicate its object selection to the user." *Id.*, 12:60-65. This is standard in augmented reality systems: as soon as a physical, real-world object beings to be modeled by an augmented reality application, that real-world object becomes part of the application.

50. With this context providing a proper understanding of Buehler's augmented reality application as encompassing both real-world and computer

data/objects, it becomes apparent that Patent Owner is incorrect in failing to appreciate that Buehler's real-world objects (as represented by images, *e.g.*, object representations) are "objects of the application," as claimed. *See* TESLA-1003, ¶¶335-337.

2. Buehler discloses matching of object representations

51. Claim 1 also recites, in part, the following language:

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

52. Patent Owner's second argument is that Buehler does not disclose a match between object representations, but instead identifies a physical object. *See* POR, 53-54. This argument is incorrect because it ignores Buehler's reliance on matches between images (object representations) as part of the process of identifying a physical object, which I explained in my Prior Declaration. TESLA-1003, ¶¶338-339.

53. As I explained previously, Buehler discloses a "detection algorithm" that "compares real-time camera images against the template and determines, based on a similarity metric, whether the real-time image contains the object of interest." TESLA-1006, 18:50-54; *see* TESLA-1003, ¶¶338-339. While the

ultimate output of Buehler's detection algorithm is the identification of a physical object, Buehler nevertheless uses matches between images to perform this identification. And Buehler discloses exactly what is claimed: a physical object is identified based on a *match* between a template image (a first object representation; *see* TESLA-1003, ¶¶335-336) and a "real-time camera image[]" of that physical object (a second object representations; *see* TESLA-1003, ¶337). *See* TESLA-1006, 18:50-54; TESLA-1003, ¶337. For instance, it was well-known that image processing techniques for identifying objects in images (*e.g.*, as implemented in Buehler's system) commonly involved finding matches between an image of an object to be identified and a library of template images.

B. Claim 3

54. Claim 3 recites the following language:

3. 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:
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**.

55. I explained in my Prior Declaration that Buehler's use of a "set threshold" is an example of the claimed features of exceeding a threshold number/percentage of at least partially matching portions. Patent Owner's argument that Buehler's metric/score "is not the specifically recited threshold number or threshold percentage" of claim 3 fails to account for how a POSITA would have understood Buehler's "set threshold" as disclosure of a threshold number or percentage for determining whether there is a match between object representations. POR, 55-56; *see* TESLA-1006, 18:54-57; TESLA-1003, ¶¶342-344.

56. As I explained in my Prior Declaration, Buehler's detection algorithm "compares real-time camera images against [a] template" using "a similarity metric," resulting in "a score for []each pixel." TESLA-1006, 18:51-57; *see* TESLA-1003, ¶¶342-344. It was conventional, and a POSITA would have understood, that standard approaches to this type of image matching involve determinations of whether a threshold is exceeded such that a match can be declared. For instance, these sorts of image matching techniques involve identifying pixels that match between two images. A 100% match is unlikely ever to occur, for instance, because of noise or slight imaging imperfections. Thus, in image matching, a threshold is typically established, and images that have a

number and/or percentage of matching pixels that exceed a threshold are deemed to be matching.

57. This is precisely how Buehler's system performs its image matching. Pixels having "[s]cores above a set threshold" are "clustered to determine the potential location of the object in the image." *Id.*, 18:57-60. These pixels having scores exceeding a threshold are "at least partially matching portions" of the object representations, *e.g.*, at least because the object representations (template images and real-time camera images) are composed of pixels. As I discussed above, a POSITA would have understood that in order for a pair of images to qualify as matching, there would be at least a threshold minimum number or percentage of pixels that have scores above that set threshold, *i.e.*, that a number or percentage of matching pixels (*a number/percentage of at least partially matching portions of the object representations exceeds a threshold number/percentage.*

C. Claim 17

58. Claim 17 recites, in part, the following language:

17. 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 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

59. Patent Owner's argument for this claim is that "Buehler's disclosure of a user making coarse and fine adjustments to the position of a gripper" is not a disclosure of "modifying any instruction sets." POR, 57-58. This argument fails to consider the objective of those user-driven adjustments in training Buehler's robot: to train the robot to perform tasks, as I explained in my Prior Declaration. TESLA-1003, ¶¶345-347. Consistent with this objective, a POSITA would have understood that if the user adjusts the configuration of the robot during training such that it can better perform a task, that adjustment would be used to modify the robot's training—*e.g.*, to modify instruction sets—such that the robot can improve its performance. TESLA-1003, ¶¶346-347. Indeed, there would be little gain in making these fine adjustments during robot training if the adjustments were not incorporated as modifications to the robot's trained actions.

IV. THOMAS, ALONE OR IN COMBINATION WITH HIRAI, RENDERS THE SUBSTITUTE CLAIMS OBVIOUS

60. PO has also submitted a Motion to Amend (MTA) in which substitute claims 21-36 were submitted.

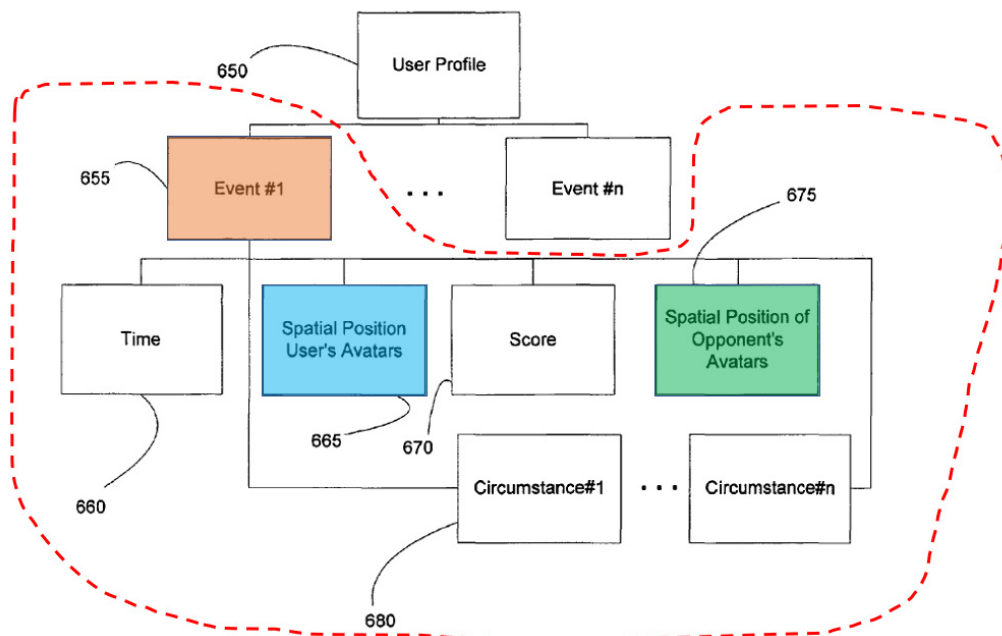
61. The substitute claims do not recite features that are unreachable by the prior art. In fact, Thomas discloses all of the features of the substitute claims. As an alternative, Thomas in combination with Hirai also renders all the substitute claims obvious.

A. Overview of Thomas

62. Thomas's approach to "simulating a particular user's behavior in an interactive computer system" is enabled through the use of "user profiles 400" (*see* FIG. 4, *infra*) implemented as "individual data structures in a database 130."

TESLA-1005 (Thomas), Abstract, 9:37-39. A user profile includes "a sub-profile" corresponding to each of "one or more events 685 and/or situations 655 that occur within the computer program 110 during operation" of the program by the user, where "[a]n event 685 is a particular action occurring," and "a situation 655 is the surrounding circumstances during which an event 685 may take place." *Id.*, 4:16-19. For instance, the sub-profile associated to Event #1 (highlighted in orange) is outlined in dashed red lines. *See id.*, 4:23-24 ("Each event 685 and situation 655 are defined by a set of one or more parameters"), 4:16-19 ("An event 685 is a particular action occurring, whereas a situation 655 is the surrounding

circumstances during which an event 685 may take place”). The sub-profile for a given event stores parameter values that define the event/situation. *See id.*, 4:23-24 (“Each event 685 and situation 655 are defined by a set of one or more parameters”).



Excerpt from Thomas, FIG. 4 (annotated)

63. The user profile is built “[d]uring learning mode” by “record[ing] a user’s input as the user is interacting with the game.” TESLA-1005 (Thomas), 9:35-36. Specifically, the user’s input is stored in the user profile such that it is “logically linked to an event and/or situation that initiated the user’s input.” *Id.*, 9:44-45. In addition, “one or more current circumstances during the occurrence of the event are analyzed and stored,” *e.g.*, parameters that define the current circumstances associated with an event/situation are stored in the sub-profile for

that event/situation. *Id.*, 9:56-59; *see* 5:9-13 (“when a user responds to an event, the 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”). Thomas provides a variety of examples of parameters that define the current circumstances (*e.g.*, the situation) corresponding to a particular event (orange *supra*), including “the spatial position of avatars controlled by the user 665” (blue), “the spatial position(s) of the avatars controlled by one or more user opponents 675 of the game” (green), and “the archetype of [each] avatar” (*e.g.*, for a basketball game, archetypes include “true point guard, slasher, shooter, pure shooter, low post scorer, midrange scorer, and role player”). *Id.*, 4:31-51; *see* 8:38-40 (“For each event, during learning mode 550, the simulator 120 records the archetype of the avatar that initiated a monitored event”).

64. In a specific example in the context of a football game, “a pre-snap state can define a situation established by current circumstances” and can be defined by “the score and spatial location on the football field, *e.g.*, the user’s team being down 21 points against an opponent, and the user’s offense is on the football field on its own 25 yard line,” and specifying “the spatial position of individual avatars, such as the linebacker or defensive back.” TESLA-1005 (Thomas), 9:46-53.

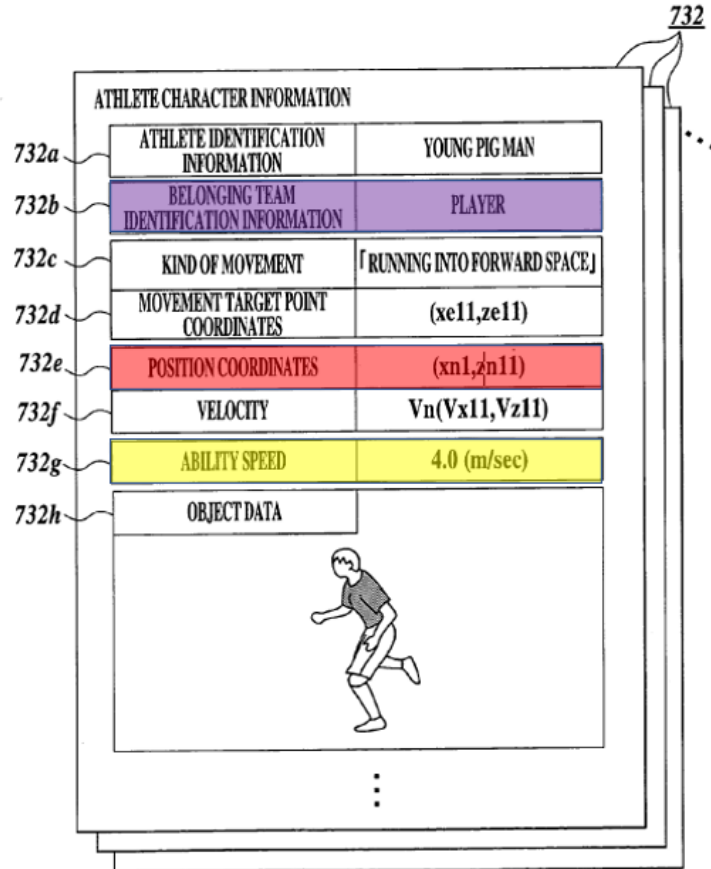
65. Later, during playback mode, when “a particular event occurs, the simulator 120 may invoke a corresponding reaction based on the stored data.” TESLA-1005 (Thomas), 9:65-67. Specifically, “the simulator 120 monitors and analyzes the operation of the computer program in search of particular events and/or situations.” *Id.*, 5:34-36. Upon identifying “the occurrence of a particular event linked to a field or sub-profile of the user’s profile,” the simulator generates a response “which would represent the second user’s response to the occurring situation or event.” *Id.*, 5:36-61; *see* 5:26-29 (“when the simulator 120 is in simulation mode, and a particular event and/or situation occurs, the simulator 120 can invoke a corresponding reaction based on the stored data, thereby simulating the user”).

B. Overview of Hirai

66. Hirai describes an approach to “realiz[ing] the movement control of non-player characters” in a video game, *e.g.*, “to bring the movements of the non-player characters closer to those of actual soccer athletes for heightening the reality of a soccer game.” TESLA-1025 (Hirai), 2:18-23. For instance, Hirai uses information about non-player characters (*e.g.*, computer-controlled characters) to “determin[e] which non-player character NPC in the team executes which movement.” *Id.*, 10:8-10; *see* 11:1-5 (“the most rational movement allocation as a

team can be performed on the positional relationships of the athletes on each occasion like in actual soccer”).

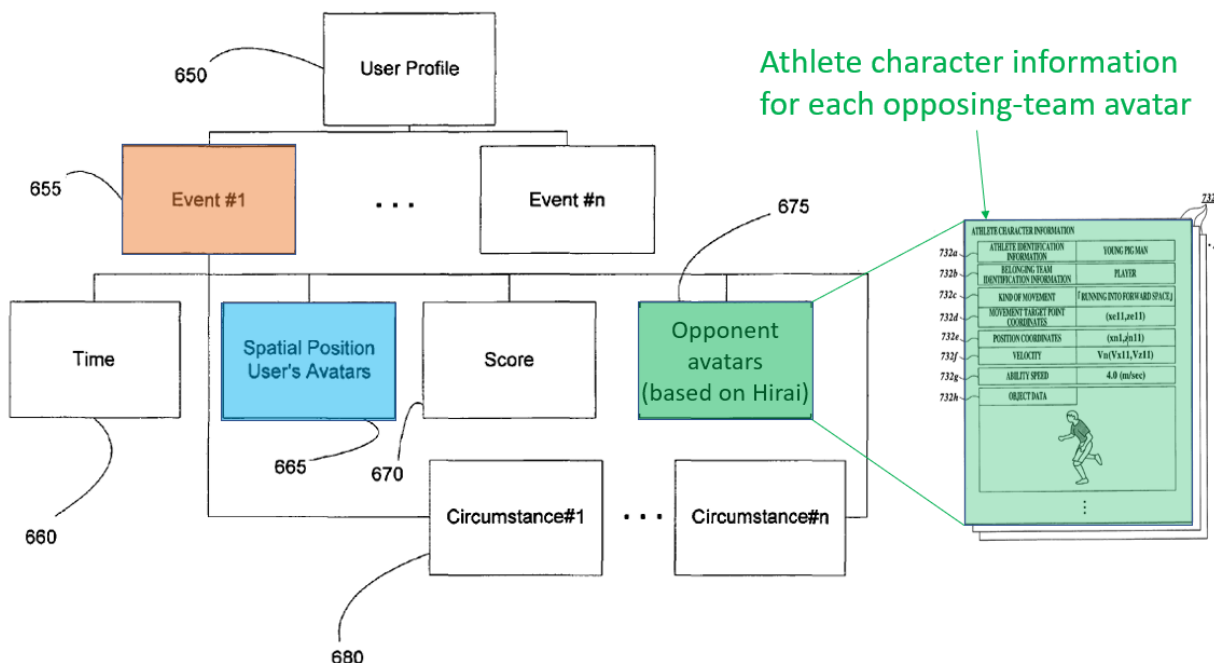
67. As shown in FIG. 9, *infra*, Hirai bases its control of non-player characters on stored “athlete character information,” which includes, among other things, “athlete identification information 732a,” “belonging team identification information 732b” (purple), “position coordinates 732e on the present pitch Fp” (red), and “an ability speed 732g” (yellow). TESLA-1025 (Hirai), 13:44-55.



Excerpt from Hirai, FIG. 9

C. The combination of Thomas and Hirai

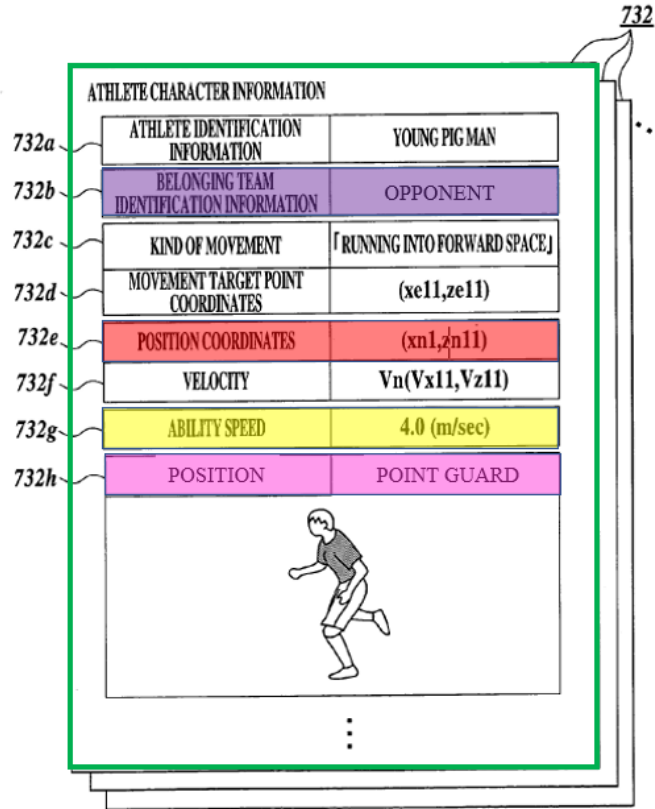
68. In the Thomas-Hirai combination, as taught by Thomas, a user profile established during learning mode contains “a sub-profile related to one or more events 685 and/or situations 655,” where the sub-profile stores parameters defining the event/situation. TESLA-1005 (Thomas), 4:13-16. For instance, a sub-profile 675 (green *infra*) for a given event (*e.g.*, Event #1, orange) stores parameters characterizing opposing-team avatars, such as “the spatial position(s) of the avatars controlled by one or more user opponents,” and “the archetype” of each opposing-team avatar, as taught by Thomas. TESLA-1005 (Thomas), 4:13-50, 9:40-45. In addition, a sub-profile 665 (blue) stores parameters characterizing the user-controlled avatar, *e.g.*, “spatial position of avatars controlled by the user.” *Id.*, 4:31-32.



Thomas-Hirai Combination (Composite figure based on Thomas, FIG. 4)

69. Further, based on Hirai, it would have been obvious to implement Thomas's sub-profile 675 such that parameters that Thomas identifies as being stored in that sub-profile, *e.g.*, parameters characterizing each opposing-team avatar, are stored in respective "athlete character information" data structures, as illustrated *supra*. TESLA-1025 (Hirai), 13:44-55. That is, the structure of Thomas's sub-profile 675 would be implemented according to Hirai's athlete character information data structure, with a separate athlete character information data structure corresponding to each opposing-team avatar. In the combination, the athlete character information data structure for each opposing-team avatar (*see* TESLA-1025 (Hirai), FIG. 9, *infra*) would store parameters including "belonging team identification information 732b" (purple) indicating that the avatar is an

opposing-team avatar, consistent with Thomas's tracking of whether the avatar is "controlled by the user" or "controlled by one or more user opponents." TESLA-1025 (Hirai), 13:44-55; TESLA-1005 (Thomas), 4:31-40. The data structure would further include "position coordinates 732e" (red) specifying the avatar's position, *e.g.*, as a way of representing the "spatial position(s) of the avatars controlled by one or more user opponents" that are already stored by Thomas. TESLA-1025 (Hirai), 13:44-55; TESLA-1005 (Thomas), 4:38-39. Additionally, the data structure would predictably include an "ability parameter[]" such as "an ability speed 732g" (yellow), based on Thomas's teaching that the stored parameters include "the archetype of the avatar," which "can be defined by relative size, strength, and speed." TESLA-1025 (Hirai), 13:44-55; TESLA-1005 (Thomas), 4:45-48; *see* 8:38-40 ("For each event, during learning mode 550, the simulator 120 records the archetype of the avatar that initiated a monitored event"). Optionally, the data structure would further include a field representing the avatar's position (pink), as described in Thomas: "In the case of a basketball game, wherein avatars represent players of the game, archetypes can include true point guard, slasher, shooter, pure shooter, low post scorer, midrange scorer, and role player." TESLA-1005 (Thomas), 4:45-51; *see* 8:38-40.



Thomas-Hirai Combination (Composite figure based on Hirai, FIG. 9)

70. I believe that a POSITA would have been motivated to implement the sub-profile 675 of Thomas’s user profile to include an athlete character information data structure (as taught by Hirai) for each opposing-team avatar for at least the following reasons.

71. The first reason why a POSITA would have implemented Thomas’s sub-profile 675 in accordance with Hirai’s suggestion for an athlete character information data structure storing parameters characterizing opposing-team avatars is to achieve the benefit expressly noted in Hirai of “bring[ing] the movements of non-player characters,” *e.g.*, opposing-team avatars, “closer to those of actual

soccer athletes for heightening the reality of a soccer game.” TESLA-1025 (Hirai), 2:20-23. A POSITA would have recognized the improved user experience that would result from implementing Thomas’s user profile in a way that further enables realistic and believable opposing-team player actions, *e.g.*, consistent with Hirai’s teaching that these approaches enable “the most rational movement allocation” to “be performed on the positional relationships of the athletes on each occasion like in actual soccer.” *Id.*, 11:1-5.

72. The second reason why a POSITA would have looked to Hirai is simply that Hirai provides a model for how to implement the general concept—a data structure storing parameters characterizing avatars—that is discussed but not detailed in Thomas.

73. The third reason why a POSITA would have been motivated to implement the Thomas-Hirai combination is because this combination merely involves the application of known techniques (*e.g.*, player-specific parameters stored in player-specific data structures) to a known system (*e.g.*, Thomas’s user profile), and it produces predictable results (*e.g.*, a user profile in which parameter characterizing opposing-team avatars are stored in avatar-specific data structures).

74. A POSITA would have reasonably expected success in pursuing the Thomas-Hirai combination at least because Thomas and Hirai both are generally in the field of video game technology, and both specifically address problems related

to the realistic computer control of video games. A POSITA also would have reasonably expected success considering that the implementation of data structures by the time of the '134 Patent was conventional and predictable.

D. Analysis of the substitute claims

75. It is my opinion that Thomas alone renders obvious the newly added features of the substitute claims. However, to the extent that Patent Owner attempts to argue that any of the features are not explicitly present in Thomas, I also offer an alternative opinion that the combination of Thomas and Hirai renders obvious the newly added features of the substitute claims.

1. Feature [SUB.1]

76. Feature SUB.1² added to each of the substitute claims is:

“wherein the first one or more object representations comprise: a first object representation that represents a first three dimensional (3D) object of the application, and a second object representation that represents a second three dimensional (3D) object of the application”

² The feature that I refer to as feature SUB.1 is identified in the Motion to Amend as element [21.h], [22.h], [23.h], [24.h], [25.h], [26.h], [27.h], [28.h], [29.h], [30.h], [31.h], [32.k], [33.k], [34.e], [35.e], and [36.h].

77. As I explained in my Prior Declaration, each of Thomas's avatars (*e.g.*, players in a sports game application) corresponds to a respective ***object of the application***. See TESLA-1003, ¶¶233-234; TESLA-1005 (Thomas), 4:32-39.

78. Thomas's avatars are ***three dimensional (3D) object[s] of the application***. For instance, a POSITA would have understood this to be the case at least because Thomas's application can be "a video game system that simulates an American football game" and "which is embodied in Visual Concepts' ESPN NFL 2K5™ ("NFL 2K5") video game, a product currently available in the market." TESLA-1005 (Thomas), 8:55-60. This NFL 2K5 video game depicted the players (*e.g.*, avatars) as 3D avatars. For instance, a review of the game includes the following image, which shows a 3D player avatar. See TESLA-1027, 3. Moreover, the review specifically notes the realistic (*e.g.*, 3D) nature of the graphics, stating that "[n]ever has a football game looked as parallel to the real game as ESPN NFL 2K5." *Id.*, 15.



Excerpt from TESLA-1027, showing a 3D player avatar

79. That is, the implementation of Thomas’s video game in the NFL 2K5 context confirms that its avatars are *three-dimensional objects*. I note that Thomas’s FIG. 5 depicts what appears to be a two-dimensional game. However, I do not take this example to limit Thomas to only two-dimensional avatars, at least in light of Thomas’s disclosure that it can be implemented in the NFL 2K5 video game, which supports three-dimensional avatars. Furthermore, I also note that the ’134 Patent uses “3D” to refer to three-dimensional computer graphics—such as those found in the NFL 2K5 game. *See* TESLA-1001, 2:11-15.

80. I also explained in my Prior Declaration that during learning mode, Thomas stores parameters defining the “current circumstances,” *e.g.*, “the surrounding circumstances during which an event 685 may take place.” TESLA-

1005 (Thomas), 4:17-19; *see* TESLA-1003, ¶¶233-234. These parameters include parameters characterizing the avatars, such as “spatial position” of user-controlled or opposing-team avatars and “archetype of the avatar,” as well as other parameters such as the time left in the game or the score of the game. TESLA-1005 (Thomas), 4:23-51, 9:43-53; ; *see* 8:37-42, 10:33-42. These stored data characterizing avatars correspond to *the first one or more object representations that represent objects of the application* (the avatars). *See* TESLA-1003, ¶¶233-234.

81. Each avatar in a given situation is characterized by corresponding parameters, *e.g.*, specifying whether that avatar is user-controlled or on the opposing team, the location of that avatar, and/or the archetype of that avatar. *See* TESLA-1005 (Thomas), 4:46-51, 9:43-53, 8:37-42, 10:33-42. Data characterizing a particular avatar (*e.g.*, a particular opposing-team avatar) corresponds to the claimed *a first object representation that represents* that particular avatar (*a first 3D object of the application*). Similarly, data characterizing a second avatar (*e.g.*, another opposing-team avatar or a user-controlled avatar) corresponds to the claimed *a second object representation that represents* that other avatar (*a second 3D object of the application*).

2. Feature [SUB.2]

82. Feature SUB.2³ added to each of the substitute claims is:

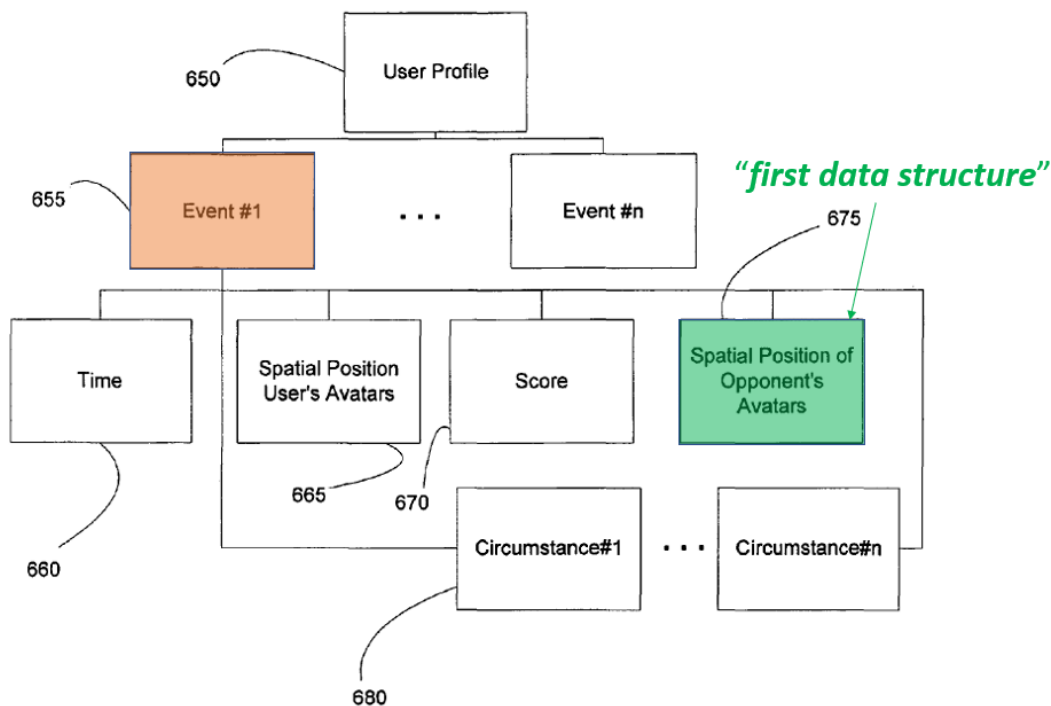
“wherein the first object representation includes a first data structure that”

83. It is my opinion that this data structure is obvious in view of Thomas alone. However, for completeness, I also present an alternative approach, in which the data structure is obvious over the Thomas-Hirai combination. I discuss each of these approaches in turn here.

This feature is obvious in view of Thomas

84. Thomas describes “data structures herein referred to as user profiles, which may be individual data structures in a database 130.” TESLA-1005 (Thomas), 4:8-10; *see* 3:57-59 (“The data is stored in a data structure generally referred to as a user’s profile, corresponding to the first user”), 9:36-39. An example user profile data structure is illustrated in FIG. 4, *infra*.

³ The feature that I refer to as feature SUB.2 is identified in the Motion to Amend as element [21.h], [22.i], [23.i], [24.i], [25.i], [26.i], [27.i], [28.i], [29.i], [30.i], [31.hi [32.k], [33.l] [34.f], [35.f], and [36.i].



Excerpt from Thomas, FIG. 4 (annotated)

85. “Each user profile has fields or sub-profiles logically associated, or linked, to one or more events and/or situations.” *Id.*, 4:10-12; *see* Abstract (“The simulator is further configured to ... store the one or more user inputs in one or more data fields”). The sub-profiles themselves “each contain[s] fields or additional sub profiles” (*e.g.*, sub-profiles 660-680 in FIG. 4) that together define the situation associated with the respective event. TESLA-1005 (Thomas), 9:40-42; *see* 4:23-24 (“Each event 685 and situation 655 are defined by a set of one or more parameters”). Each of these fields/additional sub-profiles corresponds to *a data structure* because it is composed of structured data, *e.g.*, fields containing data. Alternatively/additionally, each field/additional sub-profile corresponds to *a*

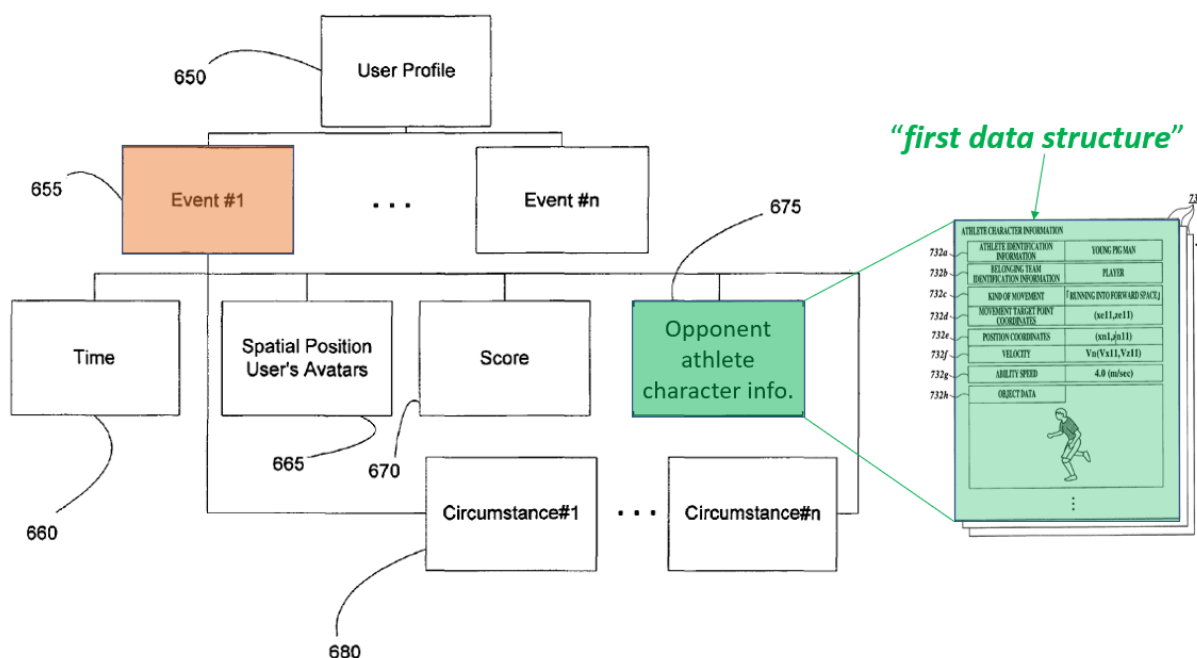
data structure because it is a portion of the user profile, which is itself a “data structure[] in a database.” TESLA-1005 (Thomas), 9:38-39.

86. Among other things, the sub-profile for Event #1 includes fields/sub-profile 675 that stores parameters characterizing opposing-team avatars, *e.g.*, specifying “the spatial position(s) of the avatars controlled by one or more user opponents 675 of the game.” *Id.*, 4:37-39. This sub-profile 675 is a data structure, *e.g.*, for the reasons I discussed in the previous paragraph. The portion of the fields/sub-profile 675 (highlighted in green in FIG. 4, *supra*) that stores parameters for a specific opposing-team avatar is likewise ***a data structure*** because it is composed of structured data (*e.g.*, fields containing parameter values for that avatar), and/or because it is a portion of the user profile data structure and a portion of the sub-profile data structure 675. The characterization of a particular opposing-team avatar (which corresponds to the claimed the ***first object representation***) includes this portion of the fields/sub-profile 675 (*i.e.*, which corresponds to the claimed ***first data structure***).

The Thomas-Hirai combination renders obvious a first data structure

87. Alternatively/additionally, as I discussed above in my overview of the Thomas-Hirai combination, Thomas’s fields/sub-profile 675 that stores parameters characterizing opposing-team avatars is implemented such that parameters characterizing each opposing-team avatar are stored in respective “athlete character

information” data structures. TESLA-1025 (Hirai), 13:44-55. That is, the sub-profile 675 includes multiple athlete character information data structures, each one storing the parameters that characterize a corresponding one of the opposing-team avatars. I have illustrated this specific implementation below. The “athlete character information” characterizing a particular opposing-team avatar (the claimed *first object representation*) corresponds to the claimed *a first data structure*.



Thomas-Hirai composite figure based on Thomas, FIG. 4

88. The athlete character information storing the parameters for each opposing-team avatar is *a data structure* at least because it is structured data, *e.g.*, in the form of fields containing values, as illustrated in Hirai’s FIG. 9. Alternatively/additionally, the athlete character information is *a data structure*

because it is a portion of the user profile, which is itself a “data structure[] in a database.” TESLA-1005 (Thomas), 9:38-39.

3. Feature [SUB.3]

89. Feature SUB.3⁴ added to each of the substitute claims is:

“is generated at least in response to processing a type and a location of the first 3D object, and”

90. Thomas describes that “a user profile 400 for each user is created and stored in the database.” TESLA-1005 (Thomas), 9:59-60; *see* 4:60-62 (“During operation, the simulator 120 retrieves, creates, or establishes, a user profile”). Specifically, to create the user profile (*e.g., the first data structure is generated*), “one or more current circumstances during the occurrence of the event are analyzed and stored” (*in response to processing* the current circumstances). *Id.*, 9:57-59. To the extent that the data structure is implemented as an “athlete character information” data structure based on Hirai, this data structure still would be generated in order to create the user profile (*e.g., the first data structure is generated*). TESLA-1025 (Hirai), 13:44-55.

⁴ The feature that I refer to as feature SUB.3 is identified in the Motion to Amend as element [21.j], [22.j], [23.j], [24.j], [25.j], [26.j], [27.j], [28.j], [29.j], [30.j], [31.j], [32.m], [33.m], [34.g], [35.g], and [36.j].

91. To the extent that Patent Owner might attempt to argue that Thomas or Thomas-Hirai do not contain an explicit statement that the data structure is generated specifically in response to processing the current circumstances, I believe that a POSITA would have found this to be, at least, an obvious implementation detail. Data structures can be generated in advance, or on demand when needed—for instance, a database table, or fields in that table, can be generated in response to receipt or generation of data to be stored in that table/those fields. Because there is nothing unexpected about either of these approaches, it is merely a simple question of the POSITA choosing one of these two approaches for implementation of the data structure of Thomas or Thomas-Hirai. That is, it would have been obvious for a POSITA to have the Thomas or Thomas-Hirai data structure storing parameters characterizing a particular situation be generated *in response to* processing the current circumstances for that situation.

92. As taught by Thomas, the current circumstances for an event can include the locations of the players on the field/court: “a situation 655 may be ... the position of players on the football field.” TESLA-1005 (Thomas), 4:19-21. That is, Thomas’s current circumstances are defined by parameters that indicate *a location of the first 3D object* (i.e., a location of an opposing-team avatar, which corresponds to the first 3D object, as I discussed above for feature [SUB.1]). For instance, in the context of a pump fake event, the “current circumstances” include

“how covered the user was,” *e.g.*, locations of the opposing-team avatars that are in the vicinity of (*e.g.*, within some threshold distance of) the user. *Id.*, 8:8-11.

Similarly, in the context of “a pass out of shot event,” the “current circumstances” include “how open the receiving avatar was and how covered the passing avatar was,” which again, indicates locations of the opposing-team avatars that are in the vicinity of the receiving and passing avatars. *Id.*, 7:56-59. These current circumstances are “defined” by parameters stored in the user profile (which is based on Thomas or Hirai, as I discussed above). That is, the data structure characterizing a particular opposing-team avatar contains parameters specifying “the spatial position(s) of the avatar[] controlled by one or more user opponents 675 of the game.” *Id.*, 4:23-24, 4:37-39. In view of Thomas’s statement that the current circumstances “are analyzed and stored,” a POSITA would have understood this analysis to involve analyzing (*e.g.*, ***processing***) ***a location of the first 3D object*** (*e.g.*, location of an opposing-team avatar) in order to obtain those spatial position parameters for storage. TESLA-1005 (Thomas), 9:57-59.

93. Thomas tracks the team affiliation of the avatars, *e.g.*, whether they are “avatars controlled by one or more user opponents” or “avatars controlled by the user.” TESLA-1005 (Thomas), 4:31-39; *see* 7:56-59, 8:8-11. A POSITA would have understood that the parameters indicating avatar spatial positions are stored in a way that indicates this team affiliation of the avatars, *e.g.*, because

Thomas tracks avatar location based on team affiliation. For instance, in the context of a pump fake event, the “current circumstances” include “how covered the user was,” *e.g.*, locations of the opposing-team avatars that are in the vicinity of the user—that is, Thomas records both position and team affiliation of the avatars. TESLA-1005 (Thomas), 8:8-11; *see* 7:55-64. The team affiliation of an avatar corresponds to the claimed *a type of the first 3D object*.

94. Again in view of Thomas’s statement that the current circumstances “are analyzed and stored,” a POSITA would have understood this analysis to involve analyzing (*processing*) *the type of the first 3D object* (*e.g.*, the avatar’s team affiliation), *e.g.*, such that each avatar’s location can be stored properly as “spatial position(s) of the avatars controlled by one or more user opponents” or of “avatars controlled by the user.” TESLA-1005 (Thomas), 4:31-39, 9:57-59.

95. “Another type of parameter” that is stored to define current circumstances is “the archetype of the avatar.” TESLA-1005 (Thomas), 4:46-47; *see* 8:33-40 (“during learning mode 550, the simulator 120 records the archetype of the avatar that initiated a monitored event”). The archetype of an avatar can be the avatar’s assigned position on the team (another example of the claimed *a type of the first 3D object*). TESLA-1005 (Thomas). For instance, Thomas lists avatar archetypes “[i]n the case of a basketball game,” as including “true point guard, slasher, shooter, pure shooter, low post scorer, midrange scorer, and role player.”

TESLA-1005 (Thomas), 4:47-51; *see* 8:33-40 (“In addition to the current circumstances above, another circumstance that can define a situation and effect the simulated user’s response is the archetype of the avatar(s), e.g., whether the avatar is a true point guard, a slasher, a shooter, a pure shooter, a low post shooter, a midrange shooter, and role player. For each event, during learning mode 550, the simulator 120 records the archetype of the avatar that initiated a monitored event”). Each of these playing positions corresponds to *a type* of the avatar. An avatar’s archetype also can be specified by its skill (which can alternatively/additionally *a type of the first 3D object*); Thomas states that “an archetype can be defined by relative size, strength, and speed.” TESLA-1005 (Thomas), 4:47-48. Again in view of Thomas’s statement that the current circumstances “are analyzed and stored,” a POSITA would have understood Thomas’s disclosure as encompassing analysis (*processing*) of an avatar’s archetype (*the type of the first 3D object, e.g., the avatar’s playing position and/or skill*), *e.g.*, in order to store parameters characterizing its archetype. TESLA-1005 (Thomas), 9:57-59.

4. Feature [SUB.4]

96. Feature SUB.4⁵ added to each of the substitute claims is:

“comprises a label indicating the processed type of the first 3D object and a coordinate indicating the processed location of the first 3D object, and”

97. It is my opinion that this feature is obvious in view of Thomas alone.

However, for completeness, I also present an alternative approach, in which the feature is obvious over the Thomas-Hirai combination. I discuss each of these approaches in turn here.

Thomas renders this limitation obvious

98. Thomas’s field/sub-profile 675 (the ***first data structure***, as I explained for feature [SUB.2] above) stores parameters specifying “the spatial position(s) of the avatars controlled by one or more user opponents 675 of the game,” *e.g.*, Thomas describes ***storing*** parameters ***indicating the processed location of the first 3D object***. TESLA-1005 (Thomas), 4:37-39; *See* 7:55-8:27. For instance, in the context of a pump fake event, Thomas describes that “the simulator 120 records

⁵ The feature that I refer to as feature SUB.4 is identified in the Motion to Amend as element [21.k], [22.k], [23.k], [24.k], [25.k], [26.k], [27.k], [28.k], [29.k], [30.k], [31.k], [32.n], [33.n], [34.h], [35.h], and [36.k].

how covered the user was,” *e.g.*, the **location** of opposing-team avatars in the vicinity of the user. *Id.*, 8:10-11.

99. Thomas does not use the term “coordinate” in describing its spatial position parameters. I note that the ’134 Patent also does not define a “coordinate,” and it does not provide any context that would narrow the plain and ordinary meaning of this well-understood term. Thus, I believe that it is appropriate to interpret the term “coordinate” as merely referring to value(s) that characterize a position or location. Indeed, dictionary definitions support this interpretation. For instance, the Merriam-Webster’s Collegiate Dictionary defines “coordinate” as “any of a set of numbers used in specifying the location of a point on a line, on a surface, or in space.” TESLA-1026, 2. Under this interpretation, Thomas’s parameters that specify “spatial positions” of the avatars are an explicit example of *a coordinate that indicates the processed location of a first 3D object*, as claimed.

100. To the extent a narrower meaning applies, a POSITA still would have found the claimed requirement for a “coordinate” to be an obvious option to choose when implementing storage of the spatial positions of avatars in Thomas. Generally, there are a limited number of options for storing location information in the context of a video game. For instance, a player’s location can be stored as coordinates (*e.g.*, either absolute coordinates with respect to a global frame of

reference such as a playing field, or relative coordinates with respect to, for instance, another player) or as vectors representative of those coordinates. These two ways of storing information merely store the same information in different forms, and it is a straightforward task to convert one form to the other and back again. Moreover, the use of coordinates—one of these limited number of options—presents no unexpected results or solutions. Importantly, I note that the claim does not impose any specific requirement on the coordinates, *e.g.*, whether they are absolute coordinates or relative coordinates.

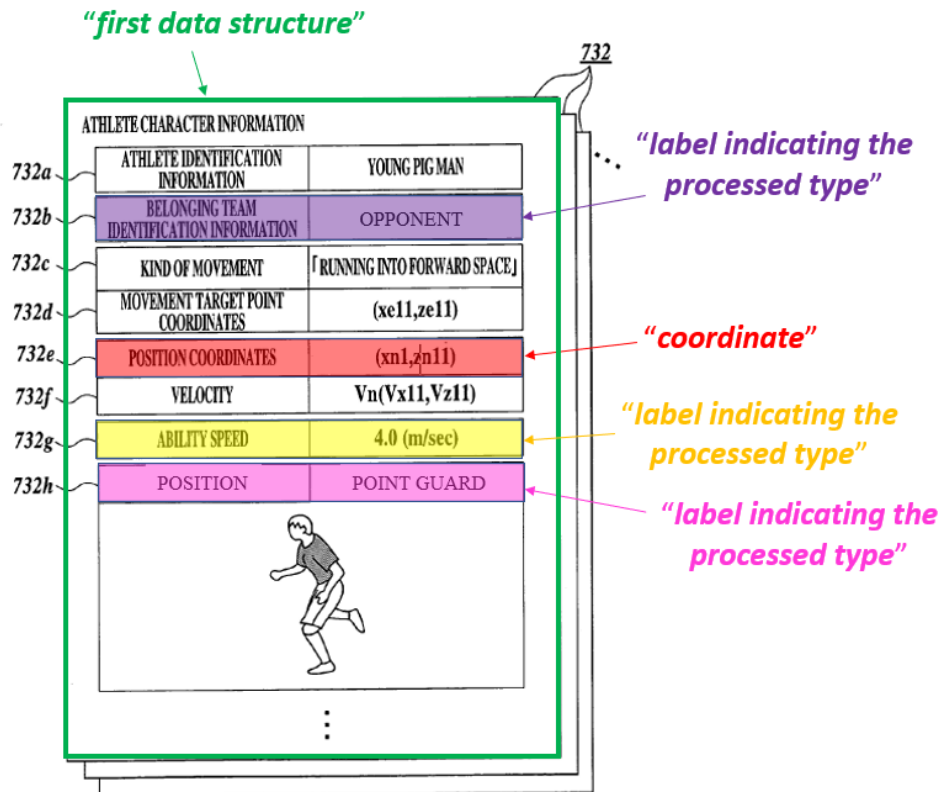
101. The fields/sub-profile 675 is specific to the “Opponent’s Avatars.” TESLA-1005 (Thomas), FIG. 4. A POSITA would have understood, or at least found obvious, that this data structure would include an indication of this team affiliation (*e.g.*, an indication of ***indicating the processed type of the first 3D object***). For instance, this is the case to provide a mechanism to distinguish between the “Opponent’s Avatars” and the “User’s Avatars” represented in a different sub-profile. This is also the case because, as I discussed above, Thomas’s system tracks location, playing position, and other characteristics based on the avatars’ team affiliations. This stored team affiliation information corresponds to ***a label***, *e.g.*, because it is a data element identifying/classifying the type (affiliation) of the avatar.

102. Alternatively/additionally, Thomas describes that “the simulator 120 records the archetype” of an avatar, *e.g.*, a parameter ***indicating the processed type of the 3D object***. TESLA-1005 (Thomas), 8:33-40; *see* 4:46-51, 9:57-59. A POSITA would have found it obvious for an avatar’s archetype (*e.g.*, playing position and/or skill level; *see* TESLA-1005 (Thomas), 4:46-51) to be stored in conjunction with other parameters characterizing that avatar, *e.g.*, in ***the first data structure*** for that avatar. For instance, a POSITA would have recognized that storing all parameters characterizing a particular avatar in a single data structure for that avatar allows for efficient analysis of the full set of parameters characterizing that avatar, to enable realistic and responsive simulations. Moreover, as above, the stored playing position and/or skill level corresponds to ***a label***, *e.g.*, because it is a data element identifying/classifying the type (archetype) of the avatar.

Thomas-Hirai renders this limitation obvious

103. Alternatively/additionally, Thomas’s fields/sub-profile 675 is implemented such that parameters characterizing each opposing-team avatar are stored in a corresponding “athlete character information” data structure (the ***first data structure***), based on the teachings of Hirai, as I discussed for feature [SUB.2], *supra*). *See* TESLA-1025 (Hirai), 13:44-55.

104. The athlete character information (the *first data structure*) includes “position coordinates 732e on the present pitch Fp,” which I have highlighted in red in Hirai’s FIG. 9 *infra*. This corresponds to the data structure including *a coordinate indicating the processed location of the first 3D object*. TESLA-1025 (Hirai), 13:53-54. For instance, those stored coordinates for a particular opposing-team avatar (*the first 3D object*) are coordinates specifying “the spatial position[]” of that avatar, consistent with Thomas’s teachings that this spatial position information is recorded. TESLA-1005 (Thomas), 4:37-39.



Thomas-Hirai composite figure based on Hirai, FIG. 9

105. This athlete character information (the *first data structure*) also stores “belonging team identification information 732b,” purple in Hirai’s FIG. 9. This belonging team information indicates whether the corresponding avatar belongs to the user’s team or the opposing team and thus is data *indicating the processed type of the first 3D object*. TESLA-1025 (Hirai), 13:48-49. Moreover, this “belonging team identification information” (team affiliation) corresponds to *a label*, e.g., because it is a data element identifying/classifying the type (affiliation) of the avatar.

106. The athlete character information data structure also stores an “ability parameter[]” such as “an ability speed 732g,” highlighted in yellow. TESLA-1025 (Hirai), 13:56-57. This ability parameter is alternatively/additionally data *indicating the processed type of the first 3D object*. For instance, this data can be data specifying the “relative size, strength, and speed” of the avatar, consistent with Thomas’s teachings that this archetype information is among the parameters characterizing avatars that are recorded. TESLA-1005 (Thomas), 4:47-48. This ability parameter corresponds to *a label*, e.g., because it is a data element identifying/classifying the type (archetype) of the avatar.

107. Additionally, the athlete character information data structure stores a parameter (highlighted in pink *supra*) indicating the avatar’s player position, again consistent with Thomas’s teaching that this information is recorded. TESLA-1005

(Thomas), 4:48-51; *see* 8:33-40. This position parameter is alternatively/additionally data *indicating the processed type of the first 3D object*, e.g., indicating the “archetype” of the avatar as specified by its player position. TESLA-1005 (Thomas), 4:48-51. This parameter corresponds to *a label*, e.g., because it is a data element identifying/classifying the type (archetype of the avatar.

5. Feature [SUB.5]

108. Feature SUB.5⁶ added to each of the substitute claims is:

*“wherein the second object representation includes a second data structure, and”*⁷

⁶ The feature that I refer to as feature SUB.5 is identified in the Motion to Amend as element [21.l], [22.l], [23.l], [24.l], [25.l], [26.l], [27.l], [28.l], [29.l], [30.l], [31.l], [32.o], [33.o], [34.i], [35.i], and [36.hl]

⁷ I note that the Substitute Claims refer to a “second object representation” in different ways. For instance, element [21.d] recites “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.” Element [21.h] states that “the first one or more object representations comprise ... a second object representation.” And Element [21.l] states that “the second object representation

109. It is my opinion that this feature is obvious in view of Thomas alone.

However, for completeness, I also present an alternative approach, in which the feature is obvious over the Thomas-Hirai combination. I discuss each of these approaches in turn here.

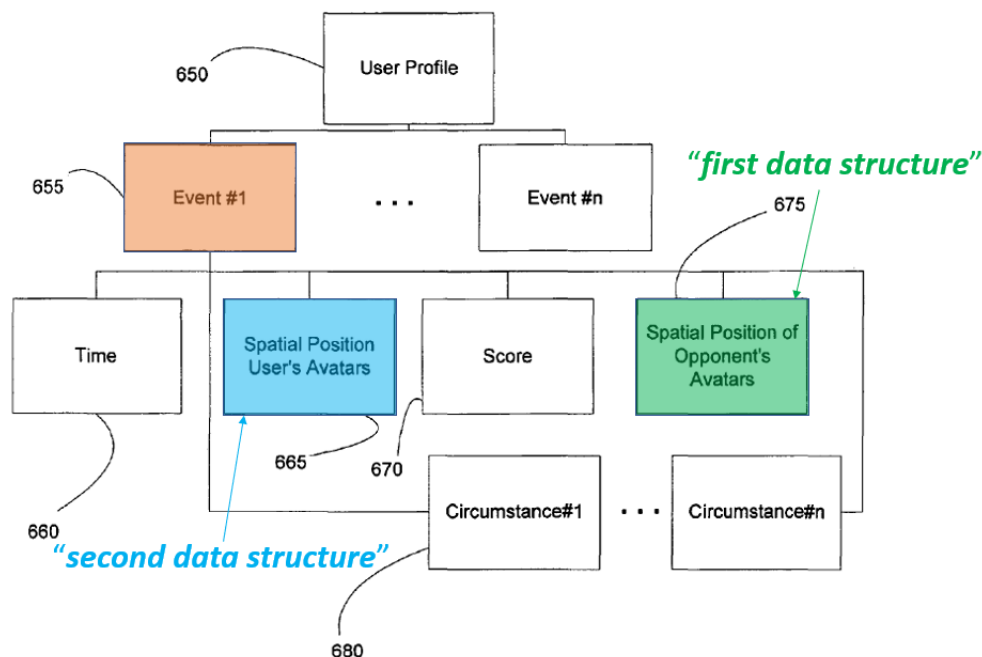
Thomas renders obvious a second data structure

110. The characterization of a second opposing-team avatar (the ***second object representation***) includes a portion of the fields/sub-profile 675 that stores parameters for that second opposing-team avatar. This other portion of the sub-profile 675 corresponds to ***a second data structure*** that stores parameters characterizing that other opposing-team avatar. *See* [SUB.2], *supra*.

111. Alternatively/additionally, Thomas's fields/subprofile 665 (a ***data structure***; *see* [SUB.2], *supra*) stores parameters characterizing user-controlled avatars, *e.g.*, "the spatial position of avatars controlled by the user." TESLA-1005 (Thomas), 4:31-33. The characterization of the user-controlled avatar (the ***second object representation***) includes the fields/subprofile 665 (***second data structure***), *blue infra*. The subprofile 665 (or portion thereof) is a data structure for reasons

includes a second data structure." Given the potential for confusion among these various uses of "second object representation," I interpret feature [SUB.5] (and other features of the substitute claims) as best I understand it.

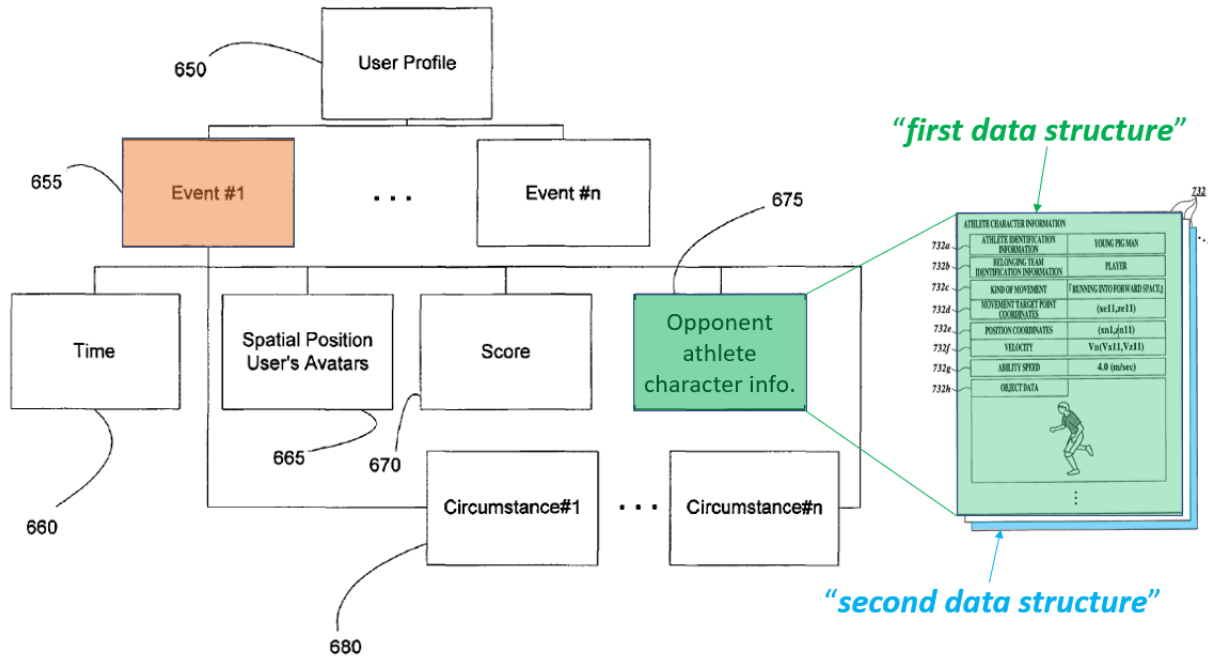
similar to those I explained above in [SUB.2] for why the subprofile 675 is a data structure.



Excerpt from Thomas, FIG. 4 (annotated)

The Thomas-Hirai combination renders obvious a second data structure

112. Alternatively/additionally, in the Thomas-Hirai combination, Thomas's sub-profile 675 characterizing opposing-team avatars is implemented such that parameters characterizing each opposing-team avatar are stored in respective "athlete character information" data structures, as illustrated *infra* and as I discussed above for element [SUB.2]. TESLA-1025 (Hirai), 13:44-55. The "athlete character information" characterizing a second opposing-team avatar (*second object representation*) corresponds to *a second data structure*, blue *infra*.



Thomas-Hirai composite figure based on Thomas, FIG. 4

6. Feature [SUB.6]

113. Feature SUB.6⁸ added to each of the substitute claims is:

“wherein the first data structure and the second data structure are correlated with the first one or more instruction sets for operating the first avatar of the application.”

114. The **first and second data structures** (implemented based on Thomas alone, or based on the Thomas-Hirai combination, as I have discussed above) store

⁸ The feature that I refer to as feature SUB.6 is identified in the Motion to Amend as element [21.m], [22.m], [23.m], [24.m], [25.m], [26.m], [27.m], [28.m], [29.m], [30.m], [31.m], [32.p], [33.p], [34.j], [35.j], and [36.m].

parameters that define a situation/current circumstance corresponding to an event (see TESLA-1005 (Thomas), 4:23-24 (“Each event 685 and situation 655 are defined by a set of one or more parameters”), where the situation and/or event are ***correlated with the instruction sets***, e.g., user inputs. See TESLA-1003, ¶¶232-236; TESLA-1005 (Thomas), Abstract (“The simulator is further configured to record one or more user inputs in response to the occurrence of the one or more events, store the one or more user inputs in one or more data fields, and associate the one or more data fields with the one or more events and the one or more current circumstances”), 5:9-13 (“when a user responds to an event, the 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”), FIG. 3a (“Associate current user input with field or sub-profile corresponding with current situation and/or event”), 4:60-5:4.

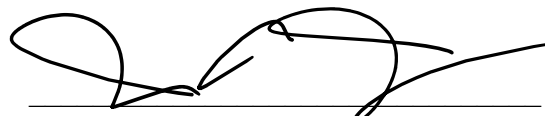
V. CONCLUSION

115. After reviewing the POR and Patent Owner's expert declaration, I was not persuaded by any of the arguments therein. As such, I still conclude that the Challenged Claims are obvious.

116. Moreover, it is my opinion that the proposed substitute claims are also obvious over prior art.

117. I declare that all statements made in this Declaration of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both (under Section 1001 of Title 18 of the United States Code).

118. Executed this 24^h day of June, 2024.



Jason Janet