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Computer graphics, image processing and environmental data representation

Secretariat: BSI (United Kingdom)

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Template for comments and secretariat observations

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MB/ NC[1]	Line number	Clause/ Subclause	Paragraph/ Figure/Table	Type of comment[2]	Comments	Proposed change	Observations of the secretariat
JP1 001				ed	"section" is used in several sentences. "clause" should be used instead of "section"		à Accepted “Section” is changed into “Clause”
AU 002			Tables 7, 8	ed	Not referenced in text	Reference tables	à Accepted Reference of tables 7, 8 is added in text.
US 003	Pg 7	02		te	The CGRM is listed as a normative reference in the standard but does not seem to be referenced or applied within section 4 (concepts and reference model).	If the CGRM is normative, reference it as/where appropriate or remove the reference.	à Accepted The CGRM reference is removed in the document.
US 004	Pg 7	03		ge		Recommend alphabetizing these terms.	à Accepted All terms are sorted according to alphabetizing.
AU 005	1	03.01.10	1	ge	Do LAEs cover real objects? If so an example should be provided, as human being, animal or bird fall into the ‘living physical’ category only.	Provide example of real object that is classified as a LAE.	à Accepted A dog and a bird are added in the document as examples of LAE.as shown in Figure
AU 006	2	03.01.12	1	ge	Does the LAE capturer only capture video information? If not, the following re-word is suggested	[Second sentence] Replace ‘A LAE’s video information will…’ with A **LAE capturer information** will …	à Accepted A LAE capturer not only captures the video information. We have replaced the sentence ‘A LAE’s video information will’ with ‘A LAE capturer information will’
AU 007	1	03.01.32	1	ed	‘or scaled’ (not and)		à Accepted The word ‘or scaled’
AU 008	1	03.01.35	1	ge	Potential reword suggestion of a Virtual Live Actor and Entity to Virtual Actor and Entity (VAE), as the actor / entity isn’t really live in this case.	Potential reword for clarity.	à Accepted All VLAEs are changed to VAE. VAE is added to clause 3.2
US 009	Pg 8	03.01.8		te	The definition for Geographic coordinate system is defined as “A coordinate system which provided by sensor devices for defining a location of LAE.”	This definition seems fairly abstract and it is unclear if this is a sensor device specific system or a defined GCS (e.g., latitude/longitude; an angular unit of measure, a prime meridian, and a datum; or all of the	à Accepted Definition of Geographic coordinate system is updated to ‘A coordinate system which is

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						above). Recommend that the definition be clarified as intended.	provided by sensor devices for defining a location of LAE. A geographic coordinate system includes an angular unit of measure, a prime meridian, latitude/longitude, and a datum. The point of LAE located is referenced by its longitude and latitude values. The longitude/latitude values are angles measured from the earth's centre to a point on the earth's surface.'
AU 010	1	03.01.8	1	ed	Missing 'is'	A coordinate system which is provided	à Accepted
AU 011		03.02		ed	Add UI User Interface and SDK Software Development Kit to list Also list should be alphabetical		à Accepted
AU 012		04		ge	Clause 4 outlines the LAE components; then clauses 5-10 provide more detail – this should be stated		à Accepted The following sentence for the clauses 5-10 is specified. "The configuration of the MAR system is shown in Figure 3 and the more detail of each component will be described in clauses 5 to 10"
AU 013	3	04.01	1	ed	'**is** defined according to **a** mixture of..'	Reword as suggested	à Accepted
AU 014	5-7	04.01	1	ed	Augmented reality refers to the view of the real world environment whose elements include LAE and objects that can be augmented by computer-generated sensory. Augmented virtuality is the virtual environment that physical world elements including LAE that can be mapped and interacted within.	Reword as suggested	à Accepted

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AU 015	4-8	04.01	1	ed	Should this paragraph use the definitions defined in clause 3 (only adding the LAE additions as required for clarity)?		à Accepted ----------
AU 016	4,7	04.01	1	te	Real Environment and Virtual Environment are excluded from the MAR definition in the MAR-RM, so this should be noted for consistency	Note that Real Environment and Virtual Environment are not covered by the MAR spectrum. But that the LAE is in the Real Environment	à Accepted ----------
AU 017	4	04.01	2	ed	change first 'that' to 'who'	Reword as suggested	à Accepted
AU 018	7	04.01	2	ge	Provide an example of an object that is an LAE, as it is not clear what objects are classified as LAEs	Provide example	à Accepted Two kinds, a dog and a bird, of a LAE are added into Figure 2.
AU 019		04.01	Fig 1	te	Make it more clear that Real Environment and Virtual Environment are not included in MAR	As above	à Accepted Fig.1 was updated to better explain the MAR concept.
AU 020		04.02		ge	Would prefer if this section was shortened, as it's hard to follow when it jumps from all components to the first with very similar content	Potential shortening of all descriptions in 4.2, so it provides a better lead in to clause 5.	à Accepted The components in clauses 4 just briefly explain.
AU 021		04.02	Fig 3	ed	Five components.. seems to be more in Fig 3? There seem to be 6 components in the figure	Reword	à Accepted We have modified from the word five components to several components.
AU 022		04.02	Table 1	ge	Table 1 not referenced in text. Also not clear which are components and what 'dimension' represents for first column. This should be 'component'?	Reference fig 1 and redo so it is consistent with fig 3	à Accepted We have added reference to the paragraph.
AU 023		04.02.2 and 4.2.3		ed	Reorder paras so they are consistent with table 1		à Accepted We have reordered the paragraphs
AU	1	04.02.5	1	te	Will this only capture a LAE in a physical world 'aiming'? If not this should be something like the	Replace A LAE in a physical world will act by aiming, to something like 'A LAE will perform actions in the physical world that will trigger	à Accepted We have replaced the sentences

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024					following	events'	according to your comment.
AU 025	3	04.02.7		ed	Delete 'a' before webVR		à Accepted We have deleted 'a'
AU 026	1	04.02.7	1	ed	MAR world is not defined in clause 3	Add definition of MAR world to clause 3.	à Accepted A MAR world is changed to a MAR scene since a MAR world is the same as a MAR scene. A MAR scene is defined in MAR RM.
US 027	Pg 17	05		te	It appears that sections 5 through 10 build upon the concepts presented in section 4 to further define the basis of the standard to which an implementor would conform. In several cases, it seems that these sections provide example devices and then provide a high level organization of the inputs/outputs.	It is unclear if these sections convey the content necessary or the context/technical description for an implementor to be able to apply this standard. Recommend a review of this section to determine if some of the content belongs in section 4 and how to better expand technically upon the content that a user of the standard needs to be able to incorporate into a MAR design in order to be conformant with the standard.	---------- This standard is used for understanding the concept of the live actor and entity representation in MAR system. So it is not enough for describing the development and implementation of the full LAE-MAR system. The information and implementation can be dealt with information model of live actor and entity contents in MAR which is the next standard related to LAE-MAR. It will cover and deal with information model for development of a LAE-MAR system.------
AU 028	1	05.02.2	2	ge	Should this be just 'smart phone' rather than 'smart phone sensor'?	Reword as suggested.	à Accepted
AU 029	1	05.02.2	3	ed	Replace 'An HMD (head mounted display)' with 'A Head Mounted Display (HMD)'	Reword as suggested.	à Accepted
AU		05.03	Table 2	ed	Should it just be ' smart phone' rather than 'phone sensor'?		à Accepted

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030							
AU 031		05.03	Table 2	ed	HMD should already be defined so don't need to reiterate here		à Accepted
AU 032	3	06.02	1	ed	Camera coordinate system should be defined in clause 3	Define physical camera coordinate system in clause 3.1.26	à Accepted Camera coordinate system is changed to physical camera coordinate system that refers to a coordinate system which is provided by a camera for capturing LAE(s) in physical world. The physical camera coordinate system is defined in clause 3.1.26.
AU 033	2	06.02	6	ed	Mentions projective coordinate system, should match Fig 8 and para 6, which is 'projective coordinate system'	Reword as suggested	à Accepted
AU 034		06.02	Fig 8	ge	Model coordinate system translated to the world coordinate system should be explained (as per para 5)	Rework as required	à Accepted The figure related to the transformation of model coordinate system to world coordinate system is updated as follows: The model coordinate system is the coordinate system where the entity's object and LAE model are initialized and created. It is a unique coordinate space of the model. Two distinct models, each with their own coordinate system, cannot interact with each other. Thus, there needs to be a universal coordinate system that allows any model to interact with any other. That universal system is called the world coordinate system. When

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							interaction occurs, the coordinate system of each model and entities are transformed into a world coordinate system. The world coordinate system is then transformed into a coordinate system called the virtual camera coordinate system.
AU 035	5	06.04		ed	LAE can be mapped into the spatial **representation**	Reword as suggested	à Accepted
AU 036	2,4	07.02	4	ge	What is the target physical object data, and target object? Isn't mentioned in previous paragraph	Mention earlier what these are, or use common terminology like LAE raw data and LAE respectively to replace those terms.	à Accepted 'the physical object data', and 'target object' are changed to LAE raw data and a LAE, because a physical object refers to a LAE.
AU 037		07.02	Table 5	ge	As above, look at 'recognized object' to 'recognized LAE action' or something similar		à Accepted The 'recognized object' is changed to 'recognized LAE action' due to the action of a LAE.
AU 038		07.02	Table 5	ed	Suggest 3nd column should be 'category'? Also table is not referenced in text		à Accepted The 3rd column and reference the table in text are changed.
AU 039		07.03	Table 6	ed	Table not referenced in text	Reference table	à Accepted
AU 040	1	08.02	2	ed	'An LAE event' rather than an event of a LAE	Reword as suggested	à Accepted
AU 041	6	08.02	3, Tables 7, 8	ed	LAE_ID (Table 7) and LAE_id (Table 8) should be consistent case. Also with event_id (Para 3) and Event_id (Table 8)	Consistent casing	à Accepted

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AU 042	3	08.02	4	ed	Missing word after 'spatial' should this be representation?		à Accepted
AU 043	4, 2	10	2, 4	ed	'the only physical object sensed is the user' contradicts 'A LAE can handle a device for generating events'	Correct the contradiction / inconsistency	à Accepted
AU 044		11		ed	Consider the term virtual actor and entity as the representation is not live	Consider changed terminology	à Accepted Virtual live actor and entity (VLAE) is changed to virtual actor and entity(VAE).
AU 045		11	2	te	If Virtual Reality is excluded from the definition of MAR, then I think this falls into the VR space.	Recommend deletion, or be more clear early on how this relates to the MAR definition defined in MAR-RM	à Accepted
US 046	Pg 32	12		te	There is good content regarding key performance parameters but metrics such as latency, augmentation, operating conditions, response time are hinted at vs being defined such that a conformant implementation could apply/measure in a manner consistent with the standards. The section seems to be more discussion and information vs technical content/approach.	Recommend, if possible, defining the key system performance considerations specifically applicable to the context of the standard (i.e., the LAE) and what metrics should be considered/measured. If possible, this could be described in the context of the reference model; e.g., the latency from the capturer to the recognizer or the latency from the capturer to the spatial mapper.	The follows are added: In LAE-MAR system, types of latency can be defined as several types. Latency of LAE capturer is the delay of capturing time from physical world for transmitting into system. In this case, the latency of LAE tracker can be occurred by the time measured of data that transmitted from one function to other function. LAE's gesture, movement, and activities in physical world can be tracked and recognized by LAE tracker and LAE recognizer. Thus, the measure time for tracking and recognizing should be considered. Latency testing and reducing latency are proposed to test the system by measuring latency with a stop watch. In some cases, hardware can be the causes of latency. High-

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							speed cameras and computer hard ware specification can be used for reducing latency as well.
AU 047	3	12	1	ed	Consistent casing for 'Chroma-keying' / 'chroma-keying'	Make consistent	à Accepted Chroma-keying is used.
US 048	Pg 32	13		te	Similar to System Performance, this section seems to be some general discussion regarding safety.	Recommend identifying and providing technical discussion related to safety if/as it applies to implementation in accordance with this standard	The follows are added: LAE-MAR system should be considered the safety guidelines for the user by applying the solutions of system configuration and safety guideline for the user in more detail. The system should be considered the encryption and protection of user's data while they are using the system and transferring data to server. Furthermore, the developers should be considered on performance and sickness that can be caused by using system. For example: while user's wearing HMD device, the quick acceleration or deceleration of camera can make user feel uncomfortable and vomit. In some case, while wearing HMD the user cannot see the environment outside. The safety guideline and system functionalities are useful for avoiding the unexpected problems.
US 049	Pg 33	14		te	Given that the reference model defined within Section 4 is somewhat generic, it is unclear what is truly required by this conformance clause. For example, one aspect of conformance states, "The movement of a LAE in a LAE-MAR system shall be	Recommend assessing the conformance clause to determine what is or is not achievable. In cases where the conformance is desired as specified but there is not enough information provided within the standard, it is	The follows are added: è This standard is used for understanding the concept of the live actor and entity representation in MAR

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					mapped, and moved naturally within a MAR world according to LAE spatial mapper as specified in Section 6". It is unclear if there is enough technical specificity with section 6 to know how to make this determination. Another clause states, "The API for a LAE-MAR implementation shall conform to the concepts specified in this standard in order to ensure compatibility and software interface interoperability between LAE-MAR implementations can be accomplished at least at the abstract API level." It is unclear how software interface compatibility could be achieved based on the information provided in sections 5 through 10.	recommended that the technical content be added into the normative technical sections. è	system. So it is not enough for describing the development and implementation of the full LAE-MAR system. The information and implementation can be dealt with information model of live actor and entity contents in MAR which is the next version of this standard. It will cover and deal with information model for development of LAE-MAR system.
AU 050		A2		ge	General comment, I assume this would be covered by VR standards, if so these should be cross referenced / checked to ensure common terminology	Check event mapping / gestures match what's in VR standards.	In A2, The follows are considered: The event mapping of a LAE in VR can be defined according to a specific event of him/her action for controlling and interacting in virtual reality. Besides the event mapping and gestures controlling which are tracked for AR, LAE can produce event mapping in VR while they are wearing HMD VR device. The event mapping for VR can be defined as follow: - Gesture controlling by attaching the sensor devices to VR headset or gesture front of sensor devices. It lets user do physical-world gestures in a virtual world. The LAE can produces event such as grabbing, punching, or picking up object in virtual scene. - Most of VR application can produce event by controlling the user's eye focusing. When

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							user's focusing on target object in given timestamp, event can be occurred. - Some HMD devices provide functionalities for controlling virtual object with its build-in touchpad. Besides that, LAE can use remote controller or joystick controller for producing event. - Hardware attaching refers to the hardware that can be provided sensing information for producing event. For example, wearable armband that senses user's arm, hand, and finger movement. Furthermore, many hardware devices are now developing in order to provide functionality for controlling in virtual reality more naturally.
AU 051		A2	2	ed	Is this a heading?		à Accepted The sentence is deleted
AU 052		A2	Fig 18. 27	ed	Should these be fig A.1, A.2 etc?		à Accepted Numbering of Figure and Table in this standard is corrected according to standard directive rule.
AU 053		A2	Table 10	ed	Should this be table A.1?		à Accepted Numbering of Figure and Table in this standard is corrected according to standard directive rule.
US 054	Pg 40	Bibliography		te	There are several references for which it is unclear if the reference was used or necessary. For example, it is not clear if Chroma Key is a required reference as the technology has been in the	Recommend reviewing the bibliography to determine if all citations are necessary or required and delete any citations that are not necessary. An example is the OpenCV	à Accepted

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					general market for many years (also, would recommend not using Wikipedia as a reference site). Another example is OpenCV in that while it was identified as the manner in which a tracker could be implemented, it was not formally cited as a reference.	reference. In section 4..2.2, that could be eliminated and it could be simply stated that the LAE Tracker could be implemented utilizing an image processing/computer vision library/software (if necessary). Would further recommend deleting the bibliography and citing any actual normative references in the normative reference section.	
US 055	Pg 31	Bibliography		te	The bibliography references ISO/IEC NP 19710, JPEG AR, 2014.	Recommend not referencing an NP.	à Accepted
US 056		General		te	Somewhat related to the US comment on the Introduction, it is unclear specifically how this standard is to be applied/conformed to. Is the intent to provide a reference model for a system developer or is it to be used to support interoperability or ease of integration between systems or between devices and a system.	If the goal is to provide more than a reference model to be employed in LAE/MAR system design (e.g., interoperability or device integration), more technical/architectural information may be required for a user of the standard to specifically develop compliant/conformant technical solutions.	è This standard is used for understanding the concept of the live actor and entity representation in MAR system. So it is not enough for describing the development and implementation of the full LAE-MAR system. The information and implementation can be dealt with information model of live actor and entity contents in MAR which is the next version of this standard. It will cover and deal with information model for development of LAE-MAR system.
US 057	Pg 5	Introduction		te	The introduction indicates that that the standard establishes required modules, minimum functions, associated information content, and information models for a compliant MAR system. In addition, it is stated that the objectives provide for the management and control of an LAE within a MAR environment as well as provide for the integration/interaction of an LAE and an exchange format to transfer and store data between LAE and MAR applications. It is apparent that the standard	Given that the document is fairly complete with respect to the functional components of the architecture, it is recommended that the goals and objectives be reassessed and clearly stated (consistently throughout the document) to reinforce the purpose and intended usage of the standard.	è This standard is used for understanding the concept of the live actor and entity representation in MAR system. So it is not enough for describing the development and implementation of the full LAE-MAR system. The information and implementation can be dealt

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					does define a reference model and some examples of devices that could be accommodated by the functional design of the reference architecture. It is not clear that information models, interactions, control interfaces, or exchange formats are defined within the standard or that they are defined to the level of specificity to be able to verify conformance.		with information model of live actor and entity contents in MAR which is the next version of this standard. It will cover and deal with information model for development of LAE-MAR system.
US 058		Throughout		ge	Throughout the standard, there are many first person references; e.g., “We assume…”, “We assign…”, “In our case, …”.	Recommend that these sections be written from the perspective of the standard; e.g., “For the purposes of this standard…”, “This standard defines three common primitive gestures of a human body…”	à Accepted
US 059		Throughout		ge	Several images within the document are grainy or low resolution.	Recommend that images be replaced with enough resolution to ensure that information is conveyed.	à Accepted

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