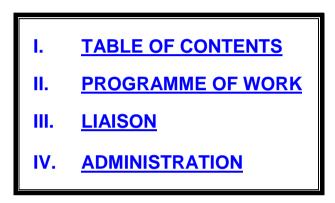|	
ISO/IEC JTC 1/SC 24	
Computer graphics, image processing and environmental data representation	
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Resolutions of 31st Meeting of ISO/IEC/JTC 1/SC 24
Arlington, Virgina, USA
11 August 2017

("P" member countries present:
Australia, China, Japan, Republic of Korea,
United Kingdom, and United States of America.)

I.   TABLE OF CONTENTS

II.   PROGRAMME OF WORK

1.   Programme of Work

ISO/IEC JTC1/SC 24 approves the Programme of Work described:

Short Title	Reference	WG	Editor	CD/PDAM/ PDTR	DIS (FCD)/ FPDAM	FDIS/FDAM/ DTR	IS*/TR
X3D Language Bindings ECMAScript Ed. 2	ISO/IEC 19777-1 Ed. 2	6	Puk, Brutzman	4/15	9/17	3/18	9/18
X3D Language Bindings Java Ed. 2	ISO/IEC 19777-2 Ed. 2	6	Puk, Brutzman	12/17	5/18	2/19	8/19
H-Anim Part 1 Architecture	ISO/IEC 19774-1 :201x	6	Lee, Yoo, Puk	8/16	9/18	3/19	3/20
H-Anim Part 2 Motion data animation	ISO/IEC 19774-2 :201x	6	Lee, Puk	8/16	9/18	3/19	3/20
MAR reference model	ISO/IEC 18039 : 201x	9/Jah G	Kim, Preda	5/16	2/17	3/18	8/18
Sensor representation in MAR	ISO/IEC 18038: 201x	9	Lee, Kim	12/17	1/19	6/19	1/20

Short Title	Reference	WG	Editor	CD/PDAM/ PDTR	DIS (FCD)/ FPDAM	FDIS/FDAM/ DTR	IS*/TR
Live actor and entity representation in MAR	ISO/IEC 18040: 201x	9	Yoo, Kim	6/17	1/19	6/19	1/20
Benchmarking of vision-based geometric registration and tracking method for MAR	ISO/IEC 18520: 201x	9	Kurata	3/17	10/17	6/18	12/18
MAR Content Information Model	ISO/IEC 21858: 20xx	9	G. Kim	3/18	12/18	6/19	12/19

* Anticipated date of IS/TR publication.

2. Authorization of Progression to IS

ISO/IEC/JTC 1/SC 24 authorizes the following documents for progression to IS upon completion of the IS text, including adoption of any resolved comments received, and requests the SC24 Secretariat to forward the text to ITTF as the text becomes available.

Document Title

ISO/IEC 19777-1 Ed. 3 Extensible 3D (X3D) language bindings—Part 1: ECMAScript
ISO/IEC 19774-1 Ed. 2 Humanoid Animation (H-Anim)—Part 1: Architecture
ISO/IEC 19774-2 Ed. 2 Humanoid Animation (H-Anim)—Part 2: Motion data animation
ISO/IEC 18039 MAR reference model

3. Authorization of progression to FDIS or IS

ISO/IEC/JTC 1/SC 24 delegates authority to the editors to prepare FDIS text for the following document(s) based on the disposition of comments that will be prepared at the Editing Meeting at the completion of the DIS ballot, if technical comments are received. If no technical comments are received, ISO/IEC/JTC 1/SC 24 delegates authority to the editors to prepare IS text.

Document Title

ISO/IEC 19777-1 Ed. 3 Extensible 3D (X3D) language bindings—Part 1: ECMAScript
ISO/IEC 19774-1 Ed. 2 Humanoid Animation (H-Anim)—Part 1: Architecture
ISO/IEC 19774-2 Ed. 2 Humanoid Animation (H-Anim)—Part 2: Motion data animation
ISO/IEC 18039 MAR reference model

4. Authorization of Progression to DAM/DIS

ISO/IEC/JTC 1/SC 24 authorizes the following documents for progression to DAM/DIS as appropriate upon completion of the DAM/DIS text and requests the SC 24 Secretariat forward to JTC1 for balloting as appropriate when the text becomes available:

Document Title

ISO/IEC 19777-1 Ed. 3 Extensible 3D (X3D) language bindings—Part 1: ECMAScript
ISO/IEC 19774-1 Ed. 2 Humanoid Animation (H-Anim)—Part 1: Architecture
ISO/IEC 19774-2 Ed. 2 Humanoid Animation (H-Anim)—Part 2: Motion data animation

ISO/IEC 18520 Benchmarking of vision-based geometric registration and tracking method for MAR
ISO/IEC 18040 Live actor and entity representation in MAR

5. Extensions for Progression Dates of Programme of Work

ISO/IEC JTC 1/SC 24 authorizes extension of progression dates for the following work items as shown in the following table:

Items	Extended for:	New Progression Date
ISO/IEC 19774-1 Ed. 2 H-Anim Architecture	9 month extension	DIS: Sep/2018 FDIS: Mar/2019 IS: Mar/2020
ISO/IEC 19774-2 Ed. 1 H-Anim motion data animation	9 month extension	DIS: Sep/2018 FDIS: Mar/2019 IS: Mar/2020

6. New formatting for future ISO/IEC SC24 standards

ISO/IEC JTC 1/SC 24 supports the removal of "frames" from ISO/IEC JTC 1/SC 24 standards published in HTML using a technique similar to that proposed in 24n3726 which still allows continuous copyright notices and authorizes the affected ISO/IEC JTC 1/SC 24 editors to work with the ISO editors to approve this or a similar method of publishing frame-less HTML documents.

7. Support for New Work

ISO/IEC JTC 1/SC 24 supports the following proposals for new work within SC24:

a) Annotation Component and Multi-planar reconstruction by the Web3D Consortium Medical Working Group co-chaired by Dr. Nicholas Polys, Virgina Polytechnic Institute (US) in cooperation with DICOM Committee;

b) Projective Texture Mapping (Working Draft has been prepared) by Prof. Kwan-Hee Yoo, Chungbuk National University (Korea);

c) Chroma Key support by Prof. Myeong Won Lee, Univ. of Suwon;

d) Extensions to support multimodal output by Dr. Gerard Kim, Korea University;

e) Development of an EXI compressed binary encoding by the Web3D Consortium in cooperation with W3C;

f) Development of a JSON encoding by Roy Walmsley, Web3D Consortium;

g) Development of a C language binding by Roy Walmsley and Prof. Myeong Won Lee;

h) Development of a C++ language binding by Roy Walmsley and Prof. Myeong Won Lee;

i) Development of a C# language binding by Prof. Myeong Won Lee and Roy Walmsley;

j) Development of a Python language binding using the NumPy library by Prof. Masaki Aono, Roy Walmsley, and Prof. Don Brutzman;

k) Mixed and Augmented Reality Functions Extension in X3D by Dr. Gun Lee, University of Canterbury (NZ);

l) H-Anim Motion data definition associated X3D binding by Prof. Myeong Won Lee of Univ. of Suwon;

m) Facial Animation in H-Anim by Prof. Jung-Ju Choi, Ajou University (Korea) and Prof. Myeong Won Lee, Univ. of Suwon (Korea);

n) X3D Physical Sensors and Interfaces by Prof. Myeong Won Lee, U. of Suwon, and Prof. Kwan-Hee Yoo, Chungbuk National Univ. (Korea);

o) CAD2X3D Conversion by Dr. Hyokwang Lee, Korea Atomic Energy Research Institute (Korea);

p) BIM2X3D Conversion by Dr. Hyokwang Lee, Korea Atomic Energy Research Institute (Korea);

q) Data-driven Visualization by Prof. Kwan-Hee Yoo, Chungbuk National Univ. (Korea) and Dr. Byounghyun Yoo, Korea Institute of Science and Technology (Korea);

r) Webizing tangible space by Dr. Byounghyun Yoo, Korea Institute of Science and Technology (Korea);

s) Extended Material Node for Representing Haptic Properties in Virtual/Augmented Reality by Prof. Gerard J. Kim, Korea University;

t) Representation for Image-based environment rendering by Prof. Gerard J. Kim, Korea University;

u) HMD VR Service Framework by Prof Kwan-Hee Yoo, Chungbuk National University;

v) X3D Mobile VR by Prof. Myeong Won Lee, The University of Suwon;

w) 3D Internal Organ Representation Model by Prof. Myeong Won Lee, The University of Suwon;

x) Animation of internal organs by 3D Deformation Techniques by Prof. Jung-Ju Choi, Ajou University;

y) Modeling method for respiration internal organs by Prof. Kwan-Hee Yoo, Chungbuk National University and Dr. Chan Park, Korea Internet Software;

z) Virtual Human Interaction by Dr. Hao Ma, Noitom Limited (China);

aa) Extensions for Shape Search in X3D by Prof. Masaki Aono, Toyohashi Univ. of Technology;

bb) glTF file format support by the Web3D Consortium and the Khronos Group;

cc) Reuse and Interoperation of Environmental Data and Processes (RIEDP) by SISO;

dd) Representation of material roughness for sensor simulation by Oktal-SE;

ee) Representation of a dynamic sea model Oktal-SE;

ff) Representation of procedurally generated geometry and terrain by Oktal-SE;

gg) Representation of Wang tiling for texture data by Oktal-SE;

hh) Representation of Patches of procedurally generated geo-typical data by Oktal-SE;

ii) Handling of varied and detailed metadata information for generation and processing of environmental data by Oktal-SE;

jj) Representation of digital holographic data content for generation and display of holographic information by Prof. Kwan-Hee Yoo;

kk) Using X3D to portray SEDRIS data by Youngsoo Kwon and Prof. Myeong Won Lee;

ll) Information Model for Live Actor and Entity in MAR (K. Yoo)

mm) Mobile VR Representation Model (M. Lee);

nn) Standardization and benchmarking for PDR (Pedestrian Dead Reckoning) (T. Kurata);

oo) Metadata Representation for (Outdoor) Context-aware MAR Services (W. Woo)

pp) MAR and Internet of Things (G. J. Kim);

qq) Perceptual requirements and validation process for MAR (Howon. Kim and G. J. Kim);

rr) Environmental/Operating conditions and augmentation visualization for MAR (G. J. Kim);

and invites the representatives of these proposals to continue to work to further develop these proposals with other proposals and other work that is underway. Upon completion of the related specifications, the representatives are invited to submit this work to ISO/IEC JTC 1/SC 24 as part of future projects.

8. Support to complete SRM Edition 3

ISO/IEC JTC 1/SC 24 recognizes and wishes to highlight the increasing use of ISO/IEC 18026 (Spatial Reference Model) in various existing and emerging applications and standards.   Such applications and standards will greatly benefit from the planned improvements to 18026. The users of these application and standards are encouraged and asked to participate in the work of completing those enhancements. The enhancements (which are also identified in ISO/IEC JTC 1/SC 24 N 3084) include:

- Comprehensive and improved treatment of geodesics
- Similarity transformation templates – additional and uniform set of methods to perform datum transformations.
- Revision of informative Annex I.6 to cover all cases of error metrics.
- Improvement of the accuracy domains in the Default profile (Clause 12).
- Comprehensive treatment of rotation and orientation concepts to include rotation of vectors and orientations of objects and coordinate reference frames, and development of the corresponding API functions

9. Support for Enhancements to Existing WG8 Work

ISO/IEC JTC 1/SC 24 supports the following proposals for new work within WG8:

Whereas:

Completed work on ISO/IEC 18025 (EDCS) and on-going revision of ISO/IEC 18026 (SRM) require modification to other SEDRIS standards, including the respective language bindings;

Therefore:

ISO/IEC JTC 1/SC 24 supports New Work Items, along with CD text to incorporate the necessary enhancements in the following standards:

- ISO/IEC 18023-1 Ed. 2   SEDRIS Part 1 Revision
- ISO/IEC 18023-3 Ed. 2   SEDRIS Part 3 Revision
- ISO/IEC 18024-4 Ed. 2   SEDRIS Language binding—C Revision
- ISO/IEC 18042-4 Ed. 2   SRM Language binding—C Revision

10.   Promoting joint work with TC 211

Whereas:

Continued opportunities for joint work with ISO/TC 211, especially in the area of ISO Geodetic Registry Network, exists;

Therefore:

ISO/IEC JTC 1/SC 24 authorizes the following to act as subject matter experts:

Dr. Paul Berner
Ms. Laura Moore
Mr. Craig Rollins
Mr. Kevin Trott

plus additional subject matter experts as may be deemed appropriate for a given task, to actively participate with TC/211 spatial experts in order to promote and facilitate joint work with TC/211.

11.   Review of proposed Enhanced X3D Geospatial Component

ISO/IEC JTC 1/SC 24 is considering the enhancement of the X3D Geospatial Component in the next version of X3D. To that end, it would be beneficial if the currently proposed specification is reviewed more widely, such as by ISO/IEC JTC 1/SC 24/WG 8, NGA Office of Geomatics, and the Open Geospatial Consortium. Therefore, ISO/IEC JTC 1/SC 24 authorizes that this preliminary specification in 24n3727 be circulated for review by the appropriate organizations. ISO/IEC JTC 1/SC 24 requests that the ISO/IEC JTC 1/SC 24 Secretary distribute 24n3727 to the named organizations for review.

12.   Inquiry regarding update to MPEG-4 profile

ISO/IEC JTC 1/SC 24 is in the process of revising ISO/IEC 19775—X3D which includes an MPEG-4 profile. ISO/IEC JTC 1/SC 24 requests that the ISO/IEC SC 24 Secretary draft a letter to the SC 29/WG 11 Convener soliciting input as to their desire to continue an MPEG-4 profile in ISO/IEC 19775. It is anticipated that the ISO/IEC 19775 revision may introduce functionality that changes the ability of X3D to support the current MPEG-4 profile.

13.   Liaison to ISO/TC 159/SC 3 for Accurate Human Anatomical Representation

ISO/IEC JTC 1/SC 24 authorizes continued liaison between ISO/IEC JTC 1/SC 24 and ISO/TC 159/SC 3 for the purpose of evaluating the Humanoid Animation Levels of Articulation for actual human use especially in the area of accurate anatomical representation for accurate medical application. Prof. Don Brutzman and Prof. Myeong Won Lee are appointed to be SC24 liaisons and are authorized to identify a suitable person in ISO/TC 159/SC 3 who is willing to review the forthcoming draft of ISO/IEC 19774-1.2.

14. Continuation of the SC 24/SC 29 Joint Ad Hoc Group - JAhG

ISO/IEC JTC 1/SC 24 endorses the continuation of the "SC 24/SC 29 Joint Ad Hoc Group – JAhG" according to the following:

a. SC 24 and SC 29 agree to continue development of a Mixed and Augmented Reality Reference Model (RM) that will be the RM used by both subcommittees.

b. The Joint Ad Hoc Group will be the arena for development of the RM and for sharing status and plans for standards related to Augmented Reality.

c. Any Reference Model or Standard document developed, as a result of the collaboration of the JAhG effort, is assigned with a single and independent ISO/IEC document number as per the ISO/IEC policy with the inclusion of text in the foreword acknowledging credit to both SCs for their contribution to it.

d. To fulfil the ISO maintenance database requirements and in agreement with SC 29, the maintenance ownership of the Reference Model/Standard document is administratively assigned to SC 24.

e. The ballot process is launched simultaneously by SC 24 (Committee Draft Ballot) and SC 29 (Committee Internal Ballot) secretariats with the support of ITTF staff for the coordination of these ballots.

f. Subsequently, the maintenance of documents produced by JAhG is performed jointly between SC 24 and SC 29 under the appropriate structure at the required time.

g. Both SC 24 and SC 29 chairmen continue to support and promote within their respective structures the good work performed by the JAhG.

According to the ISO/IEC JTC 1 Resolution 12 from 2013, ISO/IEC JTC 1/SC 24 reaffirms that it assumes the administrative role for MAR RM standardization through the JAhG with consultation of ISO/IEC JTC 1/SC 29 WG 11. As such, ISO/IEC JTC 1/SC 24 will initiate the balloting process for the DIS status of the MAR RM in coordination with ISO/IEC JTC 1/SC 29.

15. Registration and Use of Open Skies Treaty BIIF Profile

Whereas:

a. SC 24 published to the BIIF Register of Graphical Items, the new BIIF Profile from the Treaty on Open Skies called OSDE01.10;

b. "The chair of the Informal Working Group on Sensors (IWGS), of the Open Skies Consultative Commission (OSCC), Mr. Dennis Greishop, extends his thanks to the WG 7 committee members, and SC 24, for their efforts in registering the OSDE01.10 BIIF Profile and publishing it to the International Register of Graphical Items"; and;

c. The Open Skies Treaty continues to use its latest Open Skies Treaty BIIF Profile OSDE01.10 and review it for additional future submissions to ISO/IEC JTC 1/SC 24/WG 7;

Therefore:

ISO/IEC JTC 1/SC 24 endorses the continued cooperation with the Open Skies Treaty in the development of additional ISO/IEC standards profiles.

16. Continuation of Computer Vision and Image Processing Standardization

Whereas:

Yun Koo Chung presented an update on the Computer Vision Reference Model, including requirement for new experts;

Therefore:

ISO/IEC JTC 1/SC 24 endorses the continued work.

17. Contribution to ISO/TC 211 for Imagery Gridded Data

Whereas:

Cooperative metadata standards are being developed based on ISO/TC 211 imagery and geographic standards;

Therefore:

ISO/IEC JTC 1/SC 24 endorses the continued work.

18. Study Group on Visualization for Systems Integration

ISO/IEC JTC 1/SC 24 has identified a need to investigate the use of visualization in Systems Integration initiatives based on JTC 1 Standing Document (SD) 24 Systems Integration (JAG N0003) and SC24 work items related to other JTC 1 subgroups (SC24 N3935). ISO/IEC JTC 1/SC 24 therefore authorizes a Study Group to investigate the use of visualization in Systems Integration initiatives (such as Smart Cities) and appoints Dr. Peter Ryan as its rapporteur. The scope of the study group is described in SC24n3986.

19. Inconsistent Information relating to Liaison Organizations

To conform to the revised definition of Liaison Categories A, B, C and D given in the ISO/IEC Directives, ISO/IEC JTC 1/SC 24 requests the SC 24 Secretary clarify that the liaison categories of the current SC 24 Liaisons are correct and inform the Liaison Organizations in cases where the liaison category has changed. In addition, ISO/IEC JTC 1/SC 24 requests that the appropriate ISO organizations verify that the information given for Liaison Organizations on the ISO/IEC JTC 1/SC 24 web page:

(https://www.iso.org/committee/45252.html)

is correct.

20. Continuation of the Co-operation with the Web3D Consortium

Whereas:

a) Co-operation between ISO/IEC JTC 1/SC 24 and the Web3D Consortium (Web3D) continues to be productive and to the mutual benefit of both organizations;

b) there is on-going cooperation between the Open Geospatial Consortium, ISO/TC 211, the World Wide Web Consortium (W3C), and the Web3D Consortium (Web3D); and

c) there are additional standards projects in process that emanate from the Web3D Consortium and additional future work is anticipated.

Therefore:

ISO/IEC JTC 1/SC 24 endorses the continued co-operation with the Web3D Consortium in the development of additional ISO/IEC standards based on the work of the Web3D Consortium and requests that the Web3D Consortium work with SC 24 to produce a plan for anticipated future co-operation.

21. Continuation of the Co-operation with the World Wide Web Consortium (W3C)

Whereas:

a) Co-operation between ISO/IEC JTC 1/SC 24 and the World Wide Web Consortium (W3C) has been productive and to the mutual benefit of both organizations;

b) there is on-going co-operation between the Open Geospatial Consortium (OGC), ISO/TC 211, the World Wide Web Consortium (W3C), and the Web3D Consortium (Web3D);

c) there is additional work in progress related to and beyond the PNG and WebCGM specifications and because current W3C efforts may be suitable for ISO standardization, and

d) W3C efforts in the realm of Mixed and Augmented Reality (MAR) may complement and/or supplement efforts within SC24;

Therefore:

ISO/IEC JTC 1/SC 24 endorses the continued co-operation with W3C in the development of additional ISO/IEC standards based on the work of the World Wide Web Consortium and requests that W3C work with SC 24 to produce a plan for anticipated future co-operation.

22. Continuation of Co-operation with the Open Geospatial Consortium (OGC)

Whereas:

a) co-operation during the last year between ISO/IEC JTC 1/SC 24 and OGC has been productive and to the mutual benefit of both organizations;

b) there is on-going co-operation between OGC, ISO/TC 211, the World Wide Web Consortium (W3C), and the Web3D Consortium (Web3D);

c) there are projects in process that emanate from OGC and additional future work of mutual interest is anticipated; and

d) ISO/IEC JTC 1/SC 24 and OGC have mutual interest in several specific projects where each might apply base technologies developed by or in development within the other.

Therefore:

ISO/IEC JTC 1/SC 24 endorses the continued co-operation with OGC in the contribution of technology to ISO/IEC standards based on the work of the Open Geospatial Consortium and requests that OGC work with SC 24 to produce a plan for anticipated future co-operation.

23. Continuation of the Co-operation with NATO Joint Capability Group on ISR (JCGISR) and NITFS Technical Board (NTB)

Whereas:

a. For the mutual cooperation among ISO/IEC JTC 1/SC 24, NATO/JCGISR and NTB continue to be productive and to the benefit of all organizations;

b. The NATO/JCGISR and US NITFS Technical Board (NTB) have promoted BIIF profiling for various national and commercial imaging systems. They continue to prepare, test and submit profiles to SC 24 for registration. This work is expected to continue into the foreseeable future;

c. The NTB looks to receive support from ISO/IEC JTC 1/SC 24 on its interest to develop a new still imagery standard by identifying requirements for still imagery structures, and;

d. ISO/IEC JTC 1/SC 24 members discussed the high value of the BIIF standards to the JCGISR and NTB communities and anticipate continued work for ISO/IEC JTC1/SC 24 through direct and affiliated liaison;

Therefore:

ISO/IEC JTC 1/SC 24 endorses the continued cooperation with NATO/JCGISR and NTB in the development of additional ISO/IEC standards profiles and XML encodings based on the proposals of NATO/JCGISR and NTB.

24. Continuation of Co-operation with the SEDRIS Organization

Whereas:

a) Co-operation between ISO/IEC JTC 1/SC 24 and the SEDRIS Organization continues to be productive and to the mutual benefit of both organizations; and

b) There are additional SEDRIS-related standards projects in process that emanate from the SEDRIS Organization and National Bodies, and additional future work is anticipated.

Therefore:

ISO/IEC JTC 1/SC 24 endorses the continued co-operation with the SEDRIS Organization in the development of additional ISO/IEC work items based on SEDRIS-related standards.

25. Continuation of Co-operation with the Simulation Interoperability Standards Organization (SISO)

Whereas:

ISO/IEC JTC 1/SC 24 and SISO have mutual interest in several specific projects, where each might apply base technologies developed by or in development within the other and in which SISO has taken an active interest in 2015.

Therefore:

ISO/IEC JTC 1/SC 24 endorses continued cooperation with SISO.

26. Liaison with the Khronos Group

Whereas:

a. ISO/IEC JTC 1/SC 24 has benefited from its liaison with Khronos Group with respect to standardization with Mixed and Augmented Reality (MAR),
b. ISO/IEC JTC 1/SC 24 may be referencing Khronos Group specifications such as glTF, and
c. ISO/IEC JTC 1/SC 24 has the potential to derive similar benefit with respect to standardization work with computer vision;

Therefore:

ISO/IEC JTC 1/SC 24 appoints a liaison to Khronos Group to address aspects of computer technology standardization with Dr. Hwanyong Lee as ISO/IEC JTC 1/SC 24 liaison to the Khronos Group.

III. LIAISON

27. Confirmation of External Liaison Officers

ISO/IEC/JTC 1/SC 24 appoints the following external liaison officers:

Representative	Liaison to	Topic
J. Cogman	ISO/TAG 14	ISO Technical Advisory Group 14 activities
C. Body L. Beck	ISO/TC 211/WG 6	Geographic Information Imaging and Gridded Data
C. Body L. Beck	ISO/TC 211	Areas of spatial technology of common interest to both organizations.
M. Lee	ISO/IEC JTC 1/SC 29/WG 1	JPEG
G. Kim	ISO/IEC/JTC 1/SC 29/WG 11	MPEG
R. Puk	Web3D Consortium	Web3D Technologies
D. Brutzman	World Wide Web Consortium (W3C)	W3C Recommendations
R. Puk D. Brutzman	SEDRIS Organization	SEDRIS Technologies
T. Gifford R. Scrudder	Simulation Interoperability Standards Organization (SISO)	SEDRIS Technologies
K. Trott D. Brutzman	Open Geospatial Consortium (OGC)	Geospatial aspects of SC 24 standards
L. Beck M. Smith	NATO JCGISR	NATO Secondary Imagery Format STANAG 4545
L. Beck	U.S. NITFS Technical Board (NTB)	US National Imagery Transmission Format Standard
R. Cox L. Beck J. Smith	Defence Geospatial Information Working Group (DGIWG)	SEDRIS Technologies, Imagery
L. Hembree	International Hydrographic Organization (IHO)	SEDRIS Technologies
C. Rollins P. Berner K. Trott	International Astronomical Union/International Association of Geodesy (IAU/IAG) Working Group on Cartographic Coordinates and Rotational Elements of the Planets and Satellites	SRM

Representative	Liaison to	Topic
J. Cogman	NATO Modelling and Simulation Group (NMSG)	SEDRIS technology
C. Body	JTC 1/SC 41 Internet of Things	Sensor network technology of interest to SC24
R. Puk	ISO/TC 215/WG 11	Health Informatics – 3D Technology (DICOM)
R. Puk N. Polys	DICOM	X3D support of medical imaging
C. Rollins P. Berner F. Mamaghani	ISO Geodetic Registry Network (IAG and related to ISO/TC 211)	Spatial referencing
Hwanyong Lee	Khronos Group	Low-level graphics and vision interfaces including mixed and augmented reality application
Hyokwang Lee C. Mouton	ISO/TC 184/SC 4	CAD-related computer graphics standards
M. Lee D. Brutzman	ISO/TC 159/SC 3	H-Anim human anatomy model
D. Brutzman C. Wang Hyokwang Lee	ISO/IEC JTC1 SG 3 on 3D Printing and 3D Scanning	3D printing and 3D scanning
C. Body	ISO/IEC JTC1 WG 11 Smart Cities	Smart Cities
D. Brutzman K. Yoo	ISO/IEC JTC1 WG 9 Big Data	Big Data

IV.   ADMINISTRATION

28.   Approval of Business Plan 2017-2018

ISO/IEC JTC 1/SC 24 authorizes the SC 24 Secretary to update the Business Plan for 2017-2018 based on the Business Plan for 2016-2017 along with comments provided at the Arlington meeting and to circulate this revised business plan for review within ISO/IEC JTC 1/SC 24 to be concluded not later than August 21, 2017. Upon integration of any comments received, the Business Plan 2017-2018 can then be considered approved for submission to ISO/IEC JTC 1.

29.   Confirmation of Conveners

ISO/IEC JTC 1/SC 24 confirms the following Conveners;

WG	Convener	Working Group Name
6	R. Puk	Augmented reality continuum presentation and interchange
7	Y. Chung	Image processing and interchange
8	J. Cogman	Environmental representation
9	G. Kim	Augmented reality continuum concepts and reference model

30.   Replacement for WG7 Convener

Whereas:

Dr. Yunkoo Chung has indicated that he wishes to resign as WG7 Convener, his position of many years;

Therefore:

ISO/IEC JTC 1/SC 24 requests that the JTC 1/SC 24 Secretary announce the opening and request nominations from the SC 24 National Bodies.

31.   Appointment of Rapporteurs

Rapporteur	Rapporteur Group Name
P. Berner	SRM Registry
F. Mamaghani	DRM Registry
F. Mamaghani	EDCS Registry
P. Ryan	SG on Visualization for Systems Integration
J. Cogman	SWG on Business Plan

32.   Appointment of Editors

ISO/IEC JTC 1/SC 24 appoints the following editors.

Document	Editor
VRML Defects	**R. Puk** and D. Brutzman (Web3D Consortium)
CGM Defects	L. Henderson
H-Anim Defects	**R. Puk**, M. Lee, and D. Brutzman (Web3D Consortium)
X3D Part 1 Defects	**D. Brutzman** and R. Walmsley (Web3D Consortium) and R. Puk
X3D Part 2 Defects	**D. Brutzman** and R. Walmsley (Web3D Consortium) and R. Puk

Document	Editor
X3D encodings Part 1 XML Defects	**D. Brutzman** and R. Walmsley (Web3D Consortium) and R. Puk
X3D encodings Part 2 Classic VRML Defects	**R. Puk**, D. Brutzman and R. Walmsley (Web3D Consortium)
X3D encodings Part 3 Compressed Binary Defects	**R. Puk**, D. Brutzman and R. Walmsley (Web3D Consortium)
X3D language bindings Part 1 ECMAScript Defects	**D. Brutzman** and R. Walmsley (Web3D Consortium) and R. Puk
X3D language bindings Part 2 Java Defects	**D. Brutzman** and R. Walmsley (Web3D Consortium), and R. Puk
Procedures for the Registration of Items Defects	**R. Puk** and F. Mamaghani
BIIF Defects	L. Beck
SEDRIS Part 1 Functional specification Defects	**R. Puk**, F. Mamaghani, and M. Worley
SEDRIS Part 2 Abstract Transmittal Format Defects	R. Puk
SEDRIS Part 3 Transmittal format binary encoding Defects	R. Puk
SEDRIS language bindings Part 4: C Defects	**R. Puk** and M. Worley
EDCS Defects	**R. Cox**, L. Hembree, and M. Worley
EDCS language bindings Part 4: C Defects	**R. Puk** and M. Worley
SRM Defects	**P. Berner** and K. Trott
SRM language bindings Part 4: C Defects	**R. Puk** and M. Worley
X3D Encodings Part 1 Ed. 3 Defects	**D. Brutzman** (Web3D) and R. Puk
X3D Encodings Part 2 Ed. 3 Defects	**R. Puk** and L. Daly (Web3D)
X3D Encodings Part 3 Ed. 3 Defects	**R. Puk** and D. Brutzman (Web3D)
EDCS language bindings Part 4: C Edition 3 Defects	**R. Puk** and M. Worley
H-Anim Part 1 Architecture	**M. Lee.,** K. Yoo, and R. Puk
H-Anim Part 2 Motion data animation	**M. Lee** and R. Puk
X3D language bindings Part 1— ECMAScript	**R. Puk**, R. Walmsley, J. Carlson, and D. Brutzman
X3D language bindings Part 2—Java	**R. Puk**, R. Walmsley, J. Carlson, and D. Brutzman
Benchmarks for MAR: Spatial Registration and Tracking Method	**T. Kurata**
MAR reference model	**G. Kim (SC 24/WG 9), M. Preda (SC 29/WG 11)**
Sensor representation in MAR	**M. Lee,** G. Kim
Live actor and entity representation in MAR	**K. Yoo**, G. Kim
Information model for MAR contents	G. Kim

33.   Thanks to Dr. Marius Preda

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34.   Thanks to WG 6 Convener

ISO/IEC JTC 1/SC 24 wishes to thank Dr. Richard Puk for his excellent work as the WG 6 Convener.

35.   Thanks to WG 7 Convener

ISO/IEC JTC 1/SC 24 wishes to thank Dr. Yun Koo Chung for his excellent work as the WG 7 Convener.

36.   Thanks to WG 8 Convener

ISO/IEC JTC 1/SC 24 wishes to thank Dr. Jack Cogman for his excellent work as the WG 8 Convener.

37.   Thanks to WG 9 Convener

ISO/IEC JTC 1/SC 24 wishes to thank Prof. Gerard Kim for his excellent work as the WG 9 Convener.

38.   5-Year Meeting Plan

ISO/IEC JTC 1/SC 24 adopts the following 5-year meeting plan:

Date	Location
2018	Toulouse, France (subject to invitation from AFNOR)
2019	Oceania/Asia (Japan)
2020	North America
2021	Europe
2022	Oceania/Asia

39.   Meeting Plan for Electronic Meetings

ISO/IEC JTC 1/SC 24 authorizes ISO/IEC JTC 1/SC 24 working groups to conduct electronic-mail, Web conference, and teleconference meetings as appropriate to further the programme of work.

40.   Thanks to Presenters

ISO/IEC JTC 1/SC 24 wishes to thank the various presenters who provided valuable insights into the topics presented.

41.   Thanks to ISO/IEC JTC 1/SC 24 Secretary

ISO/IEC JTC 1/SC 24 wishes to express its appreciation to the BSI Secretariat and Dr. Charles Whitlock for their excellent support of ISO/IEC JTC 1/SC 24.

42.   Thanks to Special WG on the Business Plan

ISO/IEC JTC 1/SC 24 wishes to express its appreciation to the members of the Special WG on the Business Plan and its Rapporteur, Dr. Jack Cogman.

43.   Thanks to Resolutions Drafting Committee

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44.   Thanks to ISO/IEC JTC 1/SC 24 Chairman

ISO/IEC JTC 1/SC 24 wishes to thank Prof. Myeong Won Lee for her excellent work as ISO/IEC JTC 1/SC 24 Chairman.

45.   Thanks to Local Organizer and Sponsors

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