Recommendations  
of  
ISO/IEC JTC 1/SC 24/WG 6  
August 5, 2020

Part 1: Programme of Work

# Continuation of the Cooperation with the World Wide Web Consortium (W3C)

Whereas:

a) Cooperation during the last year 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 cooperation between the Web3D Consortium and the World Wide Web Consortium (W3C);

c) there has been successful past work in the form of the PNG standard ISO/IEC 15948:2003 and because current W3C efforts may be suitable for ISO/IEC standardization; and

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

Therefore:

ISO/IEC JTC 1/SC 24/WG 6 requests that SC 24 endorse 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 cooperation.

# Continuation of the Co-operation with the Web3D Consortium (Web3D)

Whereas:

a) co-operation during the last year between ISO/IEC JTC 1/SC 24 and the Web3D Consortium (Web3D) has been productive and to the mutual benefit of both organizations;

b) there is on-going cooperation between the Web3D Consortium and the World Wide Web Consortium (W3C);

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

d) 25 years of cooperative progress on interactive 3D graphics standards, which are part of the Web3D Conference series, presents special opportunities for encouraging even greater collaboration;

Therefore:

ISO/IEC JTC 1/SC 24/WG 6 requests that SC 24 endorse the continued co-operation with Web3D 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 cooperation.

# Continuation of the Cooperation with the Open Geospatial Consortium (OGC)

Whereas:

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

b) there is on-going cooperation between the Open Geospatial Consortium, ISO/TC211, the World Wide Web Consortium (W3C), and the Web3D Consortium (Web3D); and

c) there are projects in process that emanate from the Open Geospatial Consortium (e.g., CityGML) and additional future work of mutual interest is anticipated.

Therefore:

ISO/IEC JTC 1/SC 24/WG 6 requests that SC 24 endorse the co-operation with the Open Geospatial Consortium in the contribution of technology to ISO/IEC standards based on the work of the Open Geospatial Consortium and requests that the Open Geospatial Consortium work with SC 24 to produce a plan for anticipated future cooperation.

# Continuation of Cooperation with ISO/TC184/SC4/JWG16

Whereas:

a) ISO/TC184/SC4/JWG16 was established for joint work between ISO/IEC JTC1/SC24, ISO/TC184/SC4, and ISO/TC171/SC2;

c) a successful joint meeting between ISO/TC184/SC4/JWG16 and ISO/IEC JTC1/SC24/WG6 was held during this week; and

d) there are projects in process of common interest between the two groups.

Therefore:

ISO/IEC JTC 1/SC 24/WG 6 requests that SC 24 endorse the continued cooperation and participation in the work of ISO/TC184/SC4/JWG16 and requests that ISO/IEC JTC1/SC24 invite ISO/TC184/SC4/JWG16 to hold future joint meetings with ISO/IEC JTC1/SC24/WG6. Furthermore, ISO/IEC JTC1/SC24/WG6 requests that both organizations develop a plan for the active and on-going exchange of relevant documents.

# Cooperation with the Khronos Group

Whereas:

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

b) there is on-going cooperation between the Khronos Group, the World Wide Web Consortium (W3C), and the Web3D Consortium (Web3D); and

c) there are future projects that may emanate from the Khronos Group and additional future work of mutual interest is anticipated.

Therefore:

ISO/IEC JTC 1/SC 24/WG 6 requests that SC 24 welcome the Khronos Group as a Category A Liaison for the contribution of technology to ISO/IEC standards based on the work of the Khronos Group and requests that the Khronos Group work with SC 24 to produce a plan for anticipated future cooperation.

# Progression of ISO/IEC 19777-1 (ECMAScript LB) to DIS

ISO/IEC JTC1/SC24/WG6 requests that SC24 delegate authority to the editors to prepare DIS text based on the Disposition of Comments document contained in 24n3693 and submit the DIS text when available.

# Progression of ISO/IEC 19777-2 (Java LB) to DIS

ISO/IEC JTC1/SC24/WG6 requests that SC24 delegate authority to the editors to prepare DIS text based on the Disposition of Comments document that will result from the anticipated CD ballot and submit the DIS text when available.

# Progression to CD

ISO/IEC JTC1/SC24/WG6 requests that SC24 delegate authority to the editors to prepare CD text for the following specifications based on the texts that will be submitted by the Web3D Consortium as they become available:

ISO/IEC 19774-3 (HAnim Facial Animation)  
ISO/IEC 19775-1 (X3D Architecture) Version 4.0  
ISO/IEC 19775-2 (X3D Scene Access Interface) Version 4.0  
ISO/IEC 19776-1 (X3D XML Encoding) for X3D Version 4.0  
ISO/IEC 19776-2 (X3D Classic VRML Encoding) for X3D Version 4.0  
ISO/IEC 19776-3 (X3D Compressed Binary Encoding) for X3D Version 4.0  
ISO/IEC 19776-4 (X3D EXI Encoding) for X3D Version 4.0  
ISO/IEC 19776-5 (X3D JSON Encoding) for X3D Version 4.0  
ISO/IEC 19777-1 (X3D ECMAScript LB) ) for X3D Version 4.0  
ISO/IEC 19777-2 (X3D Java LB) for X3D Version 4.0  
ISO/IEC 19777-3 (X3D C LB) for X3D Version 4.0  
ISO/IEC 19777-4 (X3D C++ LB) for X3D Version 4.0  
ISO/IEC 19777-5 (X3D C# LB) for X3D Version 4.0  
ISO/IEC 19777-6 (X3D Python LB) for X3D Version 4.0

# Support for New Work

ISO/IEC JTC 1/SC 24/WG 6 supports the following proposals for new work:

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

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

Development of an JSON encoding by the Web3D Consortium;

Development of a Python language binding by Prof. Masaki Aono, Prof. Don Brutzman, and Prof. Myeong Won Lee;

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

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

Modeling architecture for respiratory internal organs by Prof. Kwan-Hee Yoo;

Standardization of glTF 2.0 file format along with physically based rendering (PBR) with corresponding advanced lighting model by the Khronos Group and inclusion of external referencing to this file format within X3D by the Web3D Consortium;

Development of both a unified X3D object model and support for semantic web relationships within X3D by the Web3D Consortium;

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

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

ISO/IEC 19776-6 (X3D Ontology and Semantic Web Encoding) for X3D Version 4.0;

and invites the representatives of these proposals to continue to work to further develop these proposals with other Web3D proposals and 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 current and future projects.

# Reformatting of ISO/IEC JTC1/SC24 standards

ISO/IEC JTC 1/SC 24/WG 6 supports the removal of “frames” from ISO/IEC JTC 1/SC 24 standards published in HTML and replacing the “Topics tables” with running indices as requested by the ISO editors and requests that ISO/IEC JTC 1/SC 24 work with the ISO editors to approve this method of publishing frame-less HTML documents. ISO/IEC JTC 1/SC 24/WG 6 also supports the creation of a document with guidelines for producing standards in HTML format based on this work.

# Review of the Khronos Group glTF PAS Submission

ISO/IEC JTC 1/SC 24/WG 6 supports the submission of the glTF specification as a PAS project within JTC 1 and requests that SC 24 further support this specification. In addition, ISO/IEC JTC 1/SC 24/WG 6 recommends that each ISO/IEC JTC 1/SC 24 national body review this specification in detail and submit comments to the ISO/IEC JTC 1/SC 24 Secretary for inclusion in a formal ISO/IEC JTC 1/SC 24 response to the JTC 1 PAS review process.

# Liaison with HL7

Whereas:

The HL7 Organization is cooperating closely with the Web3D Consortium for the purpose of allowing inclusion of X3D within medical informatics records, further becoming part of the larger ecosystem of bioinformatics standards;

Therefore:

ISO/IEC JTC 1/SC 24/WG 6 recommends that cooperation in this endeavor be encouraged and supported.

# Programme of Work

ISO/IEC JTC1/SC 24/WG 6 approves the Programme of Work and document editors described below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Short Title** | **Reference** | **WG** | **Editor** | **CD** | **DIS/DAM** | **FDIS** | **IS\*** |
|  |  |  |  |  |  |  |  |
| X3D Language Bindings ECMAScript Ed. 2 | ISO/IEC 19777-1:202x | 6 | Puk, Brutzman | 4/15 | 9/20 | 3/21 | 9/21 |
| X3D Language Bindings Java Ed. 2 | ISO/IEC 19777-2:202x | 6 | Brutzman, Puk | 12/18 | 9/20 | 3/21 | 9/21 |
| X3D Language Bindings C | ISO/IEC 19777-3:202x | 6 | Lee, Brutzman | 1/20 | 6/21 | 9/21 | 3/22 |
| X3D Language Bindings C++ | ISO/IEC 19777-4:202x | 6 | Lee, Brutzman | 1/20 | 6/21 | 9/21 | 3/22 |
| X3D Language Bindings C# | ISO/IEC 19777-5:202x | 6 | Lee, Brutzman | 1/20 | 6/21 | 9/21 | 3/22 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

\* Anticipated date of IS publication.

Part 2: Liaison

# External Liaison Officers

ISO/IEC JTC1/SC 24/WG 6 recommends the appointment of the following external liaison officers:

|  |  |  |
| --- | --- | --- |
| **Representative** | **Liaison to** | **Topic** |
| R. Puk | Web3D Consortium | 3D Web standards |
| D. Brutzman | W3C | W3C Recommendations |
| G. Kim | SC 29/WG 11 | MPEG |
| D. Brutzman | Open Geospatial Consortium | X3D Geospatial component |
| R. Puk N. Polys | DICOM | X3D support of medical imaging |
| Hyokwang Lee | ISO/TC184/SC4 | CAD-related computer graphics standards |
| C. Mouton V. Marchetti | ISO/TC184/SC4/JWG16 | STEP Visualization |
| Hwanyong Lee | KHRONOS Group | Low-level graphics interfaces |
| M. Lee D. Brutzman | ISO/TC 159/SC 3 | HAnim and human anatomy |

Part 3: Administration

# Appointment of Editors

ISO/IEC JTC1/SC 24/WG 6 recommends the following appointments:

|  |  |
| --- | --- |
| **Document** | **Editor** |
| VRML Defects | **R. Puk** and D. Brutzman (Web3D Consortium) |
| CGM Defects | **L. Henderson (CGM Open)** |
| HAnim Defects | **R. Puk,** M. Lee, and D. Brutzman(Web3D Consortium) |
| X3D language bindings Part 1 ECMAScript Defects | **D. Brutzman** (Web3D Consortium) and R. Puk |
| X3D language bindings Part 2 Java Defects | **D. Brutzman** (Web3D Consortium) and R. Puk |
| X3D Part 1 Architecture Defects | **R. Puk,** M. Lee,andD. Brutzman (Web3D Consortium) |
| X3D Part 2 SAI Defects | **R. Puk** and D. Brutzman (Web3D Consortium) |
| X3D encodings Part 1 XML Defects | **D. Brutzman** (Web3D Consortium) and R. Puk |
| X3D encodings Part 2 Classic VRML Defects | **R. Puk** and D. Brutzman (Web3D Consortium) |
| X3D encodings Part 3 Binary Defects | **D. Brutzman** (Web3D Consortium) and R. Puk |
| X3D encodings Part 5 JSON | **D. Brutzman** (Web3D Consortium) and R. Puk |
| X3D language bindings Part 1 ECMAScript | **R. Puk** and D. Brutzman (Web3D Consortium) |
| X3D language bindings Part 2 Java | **D. Brutzman** (Web3D Consortium) and R. Puk |
| X3D language bindings Part 3 C | **M. Lee** and D. Brutzman (Web3D Consortium) |
| X3D language bindings Part 4 C++ | **M. Lee** and D. Brutzman (Web3D Consortium) |
| X3D language bindings Part 5 C# | **M. Lee** andD. Brutzman (Web3D Consortium) |
| X3D language bindings Part 6 Python | **M. Aono**, M. Lee, and D. Brutzman (Web3D Consortium) |

\* Names in bold represent the principal editor(s).

# Future Meetings

ISO/IEC JTC1/SC 24/WG 6 informs SC 24 of the following expected face-to-face meetings:

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Location** | **Host** | **Purpose** |
|  |  |  |  |
| 2021 | Melbourne, FL, US | SC24 | WG6 meeting in conjunction with SC24 meeting |
| 2022 | Sydney Australia | SC24 | WG6 meeting in conjunction with SC24 meeting |
| 2023 | Europe | SC24 | WG6 meeting in conjunction with SC24 meeting |

Teleconference editing meetings will be scheduled as needed.

# Thanks to SC24 Secretary

ISO/IEC JTC 1/SC 24/WG 6 wishes to thank Dr. Charles Whitlock, BSI, for his excellent work over the last year as SC 24 Secretary.

# Thanks to Local Organizer and Sponsors

ISO/IEC JTC1/SC 24/WG 6 wishes to thank the following people and institutions for their contribution to a smooth running, pleasurable, and efficient meeting:

1. L3/Harris Corporation for volunteering to host the proposed face-to-face meeting which had to be converted to an on-line meeting due to Coronavirus lock-down and further volunteering to host the 2021 face-to-face meeting.
2. Farid Mamaghani of the SEDRIS Organization, Bill Protzman, and Peter Ryan for creating the schedule for on-line hosting of SC 24 meetings.
3. Dr. Charles Whitlock, BSI, for the smooth operation of the Secretariat.