

JTC 1/WG 12

3D Printing and Scanning

Web3D meeting
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Byoung Nam Lee, Ph.D.
Convenor, ISO/IEC JTC1/WG 12
b.n.lee@etri.re.kr

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Introduction

Overview

- The JTC 1 Study Group on 3D Printing and Scanning was established during the 31st Meeting of ISO/IEC JTC 1 Plenary (November 2016 in Lillehammer, Norway).
- Contingent upon approval of a relevant NWIP, JTC 1 established JTC 1 Working Group 12 on 3D Printing and Scanning during the 32nd Meeting of ISO/IEC JTC 1 Plenary (October 2017 in Vladivostok, Russia).
- WG 12(3D Printing and Scanning) was formally established in August 15, 2018 according to the RVN document for NWIP (ISO/IEC JTC 1 N 13852, Summary of Voting on NP 23510, Information technology - 3D Printing and Scanning - Framework for Additive Manufacturing Service Platform (AMSP)).
- The 1st WG 12 Meeting was held in October 15-17, 2018 in Seoul, Korea
- WG 12 is a System Integration WG in JTC 1

Terms of Reference

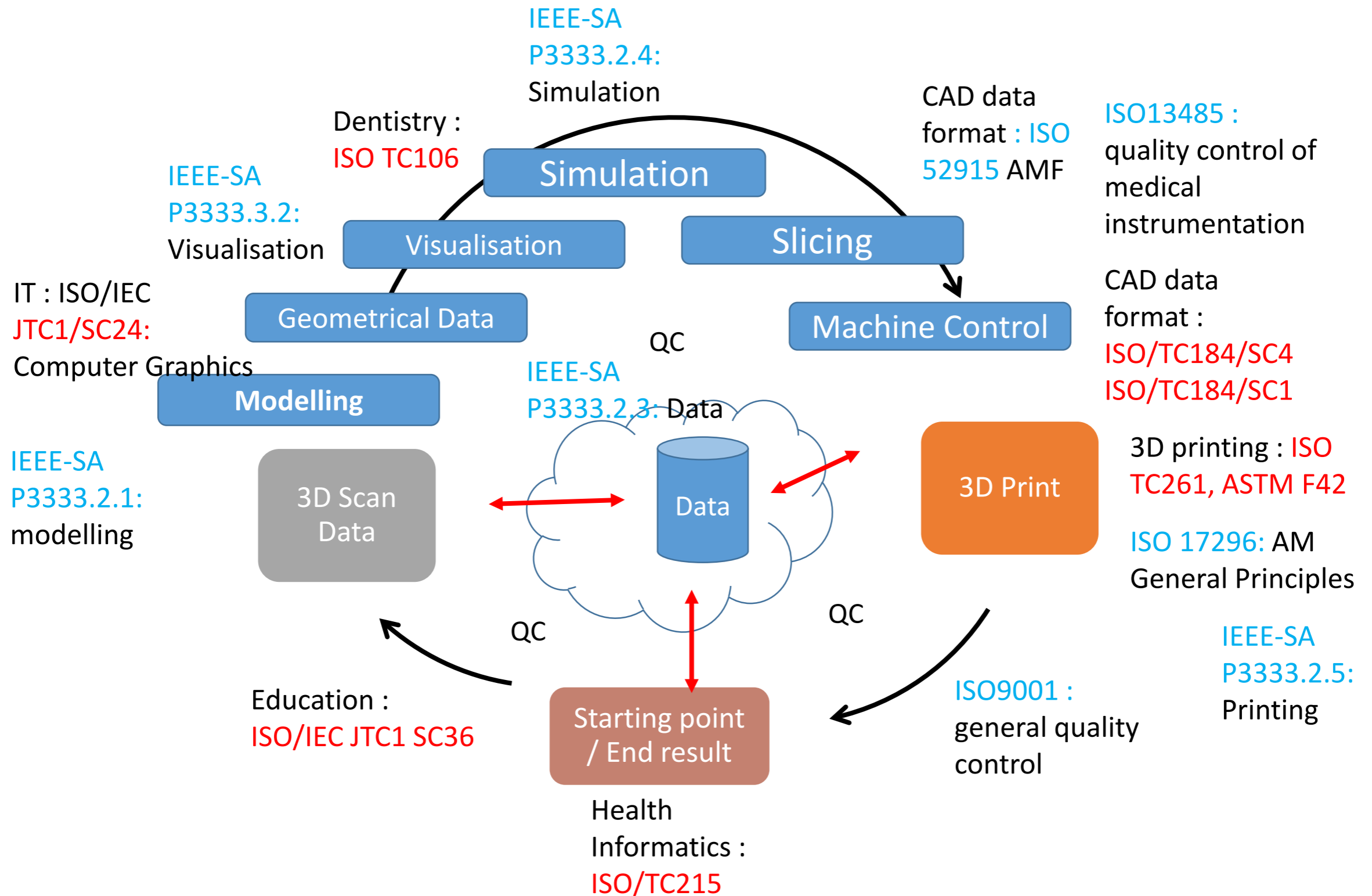
- 1) Serve as a focus of and proponent for JTC 1's standardization program on 3D Printing and Scanning.
- 2) Develop ICT related foundational standards for 3D Printing and Scanning upon which other standards can be developed.
- 3) Develop other 3D Printing and Scanning standards that are built upon the foundational standards when relevant ISO and IEC committees that could address these standards do not exist or are unable to develop them.
- 4) Identify gaps and opportunities in 3D Printing and Scanning standardization.
- 5) Develop and maintain liaisons with all relevant ISO and IEC committees as well as with external organizations that have interests in 3D Printing and Scanning.
- 6) Engage with 3D Printing and Scanning communities to raise awareness of JTC 1 standardization efforts and provide an open platform for discussion and further cooperation.
- 7) Develop and maintain a list of existing 3D Printing and Scanning standards produced and standards development projects underway in ISO TCs, IEC TCs and JTC 1.

Membership

- Currently the members of the WG 12 is being registered by National Bodies but the liaison relationship needs to be formalized through the discussion and review of it both in internal and external liaison organizations at the 1st WG 12 meeting(October 15-17, 2018) in Seoul, Korea.
- As of January 2019, WG 12 has 54 members from 10 National Bodies, IEC registered in the ISO Global Directory (GD). AFNOR, ANSI, BSI, JISC, KATS, NSAI, SAC, SCC, SII, UNI
- Liaison Representatives will be registered in the ISO Global Directory (GD). Internal Liaison relation will be set up shortly but it will take time for external Liaison relation.
- Internal liaison
 - JTC 1/SC 24, JTC 1/SC 28, JTC 1/SC 29, JTC 1/SC 31, JTC 1/SC 38, JTC 1/SC 41, JTC 1/SC 42
 - ISO/TC 106, ISO/TC 150, ISO/TC 184/SC 1, ISO/TC 184/SC 4, ISO/TC 215, ISO/TC 261
 - IEC/TC 62, IEC/TC 65, IEC TC/119
- External liaison
 - Web 3D Consortium, Khronos Group, DICOM WG 17, ASTM F42

3D Printing and Scanning

Proposed Generic Workflow View for 3D Printing and Scanning Processes



Use cases in 3D printing and scanning industry

Medical Industry	Health & Wellness	Gaming & Animation
Cranial 3D scanning and printing Dental prostheses Decease recognition (mixed) Prosthesis creation Manufacturing of surgical practice dummies	Fitness Body wellness Artificial Intelligence Healthcare	3D gaming Movie animation Personal animation and personalization
AR & VR Activities	Manufacturing	Apparel & Fashion
Leisure and business use cases	Aerospace Automobile Electronics Consumer goods	Fitting / online clothes sale Made to measure clothes Fashion design
Urbanization	Transportation	Industry R&D
Building industry City / environment planning Road and railway design and manufacturing	Land Air Sea Space	3D scanning and printing used to fasten product development cycles

Relevant Standardization Activity

- **ISO TC 261 Additive manufacturing**
- ISO TC 61 (Plastics)
- ISO TC 106 (Dentistry)
- ISO TC 119 (Powder Metallurgy)
- ISO TC 171/SC 2 (Document File Format)
- ISO TC 172/SC 9 (Electro-optical Systems)
- **ISO TC 184/SC 1 (Industrial Cyber and Physical Manufacturing Systems)**
- **ISO TC 184/SC 4 (Industrial Data)**
- **IEC TC 62 (Electrical Equipment in Medical Practice)**
- **IEC TC 76 (Optical Radiation Safety and Laser Equipment)**
- **IEC TC 108 (Safety of Electronic Equipment within the Field of Audio/Video, Information Technology and Communication Technology)**
- **IEC TC 119 (Printed Electronics)**
- **IEEE-ISTO Printer Working Group (PWG)**
- **IEEE C3DP (Consumer 3D Printing Working Group)**

Relevant Standardization Activity

- IEEE 3DMA (3D Based Medical Application Working Group)
- **ASTM Committee F42 on Additive Manufacturing Technologies**
- **ASTM Committee E57 on 3D Imaging Systems**
- **3MF Consortium**
- DICOM (Digital Imaging and Communications in Medicine)
- Khronos 3D Format Working Group
- CIE (International Commission on Illumination) Division 8 (Image Technology)
- **Web3D Consortium**
- **JTC 1/SC 24**
- **JTC 1/SC 28**
- **JTC 1/SC 29/WG 11**
- **AMSC (Additive Manufacturing Standardization Collaborative)**

JTC 1 Perspectives

- The survey of standardization activities has shown that:
 - Most activities are focused on the industrial market
 - Most activities are focused on material and industrial processes
 - Coordination and cooperation with various stakeholders are needed
- Some general opportunities provided are:
 - Increased use of standards in manufacturing
 - Lower production costs because of greater efficiency
 - Improved support for complex tasks
 - Increased flexibility for localized and distributed production, including via print service bureaus
 - New technical solutions because of greater understanding and ease of use of systems

JTC 1 Perspectives

- Industry and suppliers have difficulty knowing how to apply the standards, even though they would provide significant advantages. There is a problem of information overload where there is too much information of a general nature for people to find out what they need to know.
- Some possible gaps are:
 1. Single point of reference for user community to find out information about 3D printing and scanning implementation
 2. Coordination of aims within standardization activities
 3. Information collection point for contact between user community and standardization bodies
 4. Knowledge of how and where to apply standards
 5. Possibility to evaluate standards in different circumstances
 6. Links to education and professional bodies to further lifelong learning

WG12 work Plan

Work Items

- ISO/IEC WD 23510, Information technology – 3D Printing and Scanning – Framework for Additive Manufacturing Service Platform (AMSP)
- ISO/IEC NP 24056, Information technology – 3D Printing and Scanning – Requirement of Image-based Modelling for Covering Cranial Defect
- ISO/IEC Future WI, Information technology – 3D Printing and Scanning – Overview and vocabulary
- ISO/IEC Future WI, Information technology – 3D Printing and Scanning – Segmentation for Image-Based Modeling of Orbit

SG on 4D Printing

JTC 1/WG 12 established a Study Group on 4D Printing during 1st F2F WG 12 meeting in 2018. WG 12 appoints François Coallier as Convenor of the SG.

The Terms of Reference are as follows:

1. Provide a description of key concepts and terminology related to 4D Printing.
2. Study and document the technological, market and related societal requirements for ICT Standardization on 4D Printing.
3. Study and document current technologies that are being deployed to enable 4D Printing.
4. Assess the current state of standardization activities relevant to 4D Printing in other relevant ISO and IEC TCs, in other SDOs and in consortia.
5. Identify and propose how JTC 1 could address ICT standardization needs of 4D Printing.
6. Provide a progress report to the 2nd F2F WG 12 meeting including recommendations for further study and/or potential NWIPs.