

ISO/IEC TR 23090-27:2025-06 (E)

Information technology - Coded representation of immersive media - Part 27: Media and architectures for render-based systems and applications

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Overview	4
4.1	Motivation to develop standards for distribution of scene-based media	4
4.2	Immersive displays and their information requirements	5
4.2.1	General	5
4.2.2	Raster media, 3D graphics and information requirements of immersive displays	5
4.2.3	Defining necessary and sufficient thresholds of media information	6
4.2.4	Accommodating displays with a variety of information requirements	6
4.3	Content creation not in scope for MPEG International Standards	6
4.4	Challenges for distribution of immersive media	7
4.4.1	Interoperability between renderers	7
4.4.2	Interchange between media formats	7
4.4.3	Lack of standard specifications of media format	8
5	On the usage of Immersive Technology Media Format for media interchange	8
6	Media workflow from content production to distribution	8
6.1	Introduction to media workflows	8
6.2	Camera captured	9
6.3	Computer generated	9
6.4	Hybrid	9
6.5	Display considerations	10
6.6	Clarifications on media workflow terminology	10
6.6.1	Mastering format	10
6.6.2	Contribution, mezzanine, or ingest format	10
6.6.3	Distribution or last-mile format	11
6.7	Observations about media formats and variety of displays	11
7	Renderers	11
7.1	Introduction to renderers	11
7.2	Classification of rendering methods	12
7.2.1	Real-time renderers	12
7.2.2	Non real-time or offline renderers	12
7.3	Families of rendering techniques for immersive applications	12
7.3.1	Rasterisation	12
7.3.2	Ray tracing	12
7.3.3	Hybrid	13
7.4	Other rendering considerations	13
7.4.1	Distributed and network rendering and “edge compute”	13
7.4.2	Scene compression	13
7.4.3	Anti-aliasing	13
7.4.4	Deep learning	13
7.4.5	Hardware	13
7.5	Current state of the art	14

8	Immersive displays	14
8.1	Characterizing the immersive display	14
8.2	Fundamental output units of displays	14
8.2.1	Points of light	15
8.2.2	Rays of light	15
8.2.3	Waves of light	15
8.3	Families of displays emitting points of light	15
8.3.1	Single panel planar displays	15
8.3.2	Multi-planar displays	15
8.3.3	Volumetric displays	15
8.4	Families of displays emitting rays of light	16
8.4.1	Dense light field displays	16
8.4.2	Low density ray displays	16
8.5	Families of displays emitting waves of light	16
9	Architectures and interfaces	17
9.1	General	17
9.2	Architecture for streaming of frame-based media	17
9.3	Architecture for streaming of scene-based media	18
9.4	Hypothetical immersive display architecture	20
9.5	Architecture for scene graph representations	21
9.6	Architecture for scene graph representations with a shared asset	22
9.7	Architecture for annotated scene graph using IMS	23
9.8	Architecture for translation between scene graph representations using IMS	23
9.9	Adaptation of scene-based media to the capabilities of the client and/or to current conditions	25
10	Use cases, requirements and assumptions	26
10.1	General	26
10.2	Scenario 1 Distribution to a single immersive media client (display)	26
10.2.1	Introduction to scenario 1	26
10.2.2	Desired features for scenario 1	26
10.3	Scenario 2 Distribution to heterogeneous set of immersive media clients (displays)	26
10.3.1	Introduction to scenario 2	26
10.3.2	Desired features for scenario 2	27
10.4	Scenario 3 Distribution to both legacy and immersive media clients (displays)	27
10.4.1	Introduction to scenario 3	27
10.4.2	Desired features for scenario 3	27
10.5	Current assumptions	27
	Bibliography	28