Introduction to MPEG-V
(Media Context & Control)

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Sanghyun Joo (joos@etri.re.kr)
Electronics and Telecommunications Research Institute
Problem issue
Transition of Media Consumptions

SMSD (Single Media Single Device)

A/V

Single Renderer

SMMD (Single Media Multiple Devices)

A/V

DCI

RoSE Media Controller

MDSM (Multiple Devices Single Media)

A/D

DCI

Home Server
Metaverse (roadmap report ’07)
RoSE System Architecture

Scope of Standardization (normative)

1. Sensory Effect Delivery Format
2. User Preferences Delivery Format
3. Sensory Device Capability Delivery Format
4. Sensory Device Command Delivery Format

Not in the scope of standardization (informative)
23005: MPEG-V (Media Context and Control)

Part 1. Architecture
Part 2. Control Information
Part 3. Sensory Information
Part 4. Virtual World Object Characteristics
Part 5. Data Formats for Interaction Device
Part 6. Reference Software
Part 1: Architecture

MPEG-V Architecture

Digital Content Provider
(Virtual World, (serious) game, simulator, DVD, ...)

Enriched content

Adaptation RV/VR

Virtual World Data Representation V

Virtual World N

Adaptation RV/VR

Adaptation RV

Adaptation VR

Device Commands

Real World Dev1

Real World Dev2

Real World Dev3

User Interaction

Standardization Area B: Sensory Information
(Part 3, 4, ...)

Standardization Area A:
Control information
(Part 2)

Areas A & B are targets of MPEG-V standardization

Sensor

Actuator

Real World Device N

Real World Data Representation
Instantiation 1: RoSE

Diagram showing the flow of media and control signals from a source to a user through a media processing engine and rendering devices, indicating various senses such as vision, audition, olfaction, and thermoception.
Instantiation 2: Exchanges between real and virtual worlds
Instantiation 2: Exchanges between real and virtual worlds

2.1 Full motion control and navigation of avatar/object with multi-input sources
2.2 Virtual Travel
2.3 Serious gaming for Ambient Assisted Living
2.4 Virtual Traces of Real Places
Instantiation 3: Exchanges between virtual worlds

3.1 Avatar Appearance
3.2 Social presence
3.3 Group Decision-making in the context of Spatial Planning
3.4 Consumer Collaboration in Product Design Processes along the Supply Chain
3.5 Virtual Objects
Instantiation 4: Control of avatars and other virtual objects by real signals

4.1 Internet Haptic Service – YouTube, Online Chatting
4.2 Next Generation Classroom – Sensation Book
4.3 Immersive Broadcasting – Home Shopping, Fishing Channels
4.4 Entertainment – Game (Second Life, Star Craft), Movie Theater
4.5 Virtual Simulation for Training – Military Task, Medical training
Part 2: Control Information

Normative references
ISO/IECIS 15938-12, Information technology -- Multimedia content description interface -- Part 5: Multimedia description scheme
ISO/IECIS 21000-7, Information technology -- Multimedia framework (MPEG-21) -- Part 7: Digital item adaptation

Device Capabilities
- Sensory Device capability base type
- Sensory Device capability base attributes
- Individual device capability types
- Sensor capability base type
- Sensor capability base attributes
- Individual sensor capability types

Device Commands
- Device command base type
- Device command base attributes
- Individual Device Command Types

User Sensory Preferences
- SensoryPreference base type
- User sensory preference base attributes
- User’s sensory preference types for individual sensory effects

Sensed Information
- Sensed information base type
- Sensed information base attributes
- Individual sensor types
Part 2: Control Information

Normative references
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ISO/IECIS 21000-7, Information technology -- Multimedia framework (MPEG-21) - Part 7: Digital item adaptation

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Device Commands
- Device command base type
- Device command base attributes
- Individual Device Command Types

Sensed Information
- Sensed information base type
- Sensed information base attributes
- Individual sensor types
## Part 2: Control Information

### Individual Device Capability types
- Light capability type
- Flash capability type
- Heating capability type
- Cooling capability type
- Wind capability type
- Vibration capability type
- Scent capability type
- Fog capability type
- Sprayer capability type
- Color correction capability type
- Tactile capability type
- Kinesthetic capability type
- RigidBodyMotion capability type

### Individual sensor capability types
- Light sensor capability type
- Ambient noise sensor capability type
- Temperature sensor capability type
- Humidity sensor capability type
- Length sensor capability type
- Atmospheric Pressure sensor capability type
- Position sensor capability type
- Velocity sensor capability type
- Acceleration sensor capability type
- Orientation sensor capability type
- Angular velocity sensor capability type
- Angular acceleration sensor capability type
- Force sensor capability type
- Torque sensor capability type
- Pressure sensor capability type
- Motion sensor capability type
- Intelligent camera capability type
### User’s sensory preference types for individual sensory effects
- Light preference type
- Flash preference type
- Heating preference type
- Cooling preference type
- Wind preference type
- Vibration preference type
- Scent preference type
- Fog preference type
- Spraying preference type
- Color correction preference type
- Tactile preference type
- Kinesthetic preference type
- RigidBodyMotion preference type

### Individual Device Command Types
- Light type
- Flash type
- Heating type
- Cooling type
- Wind type
- Vibration type
- Scent type
- Fog type
- Spraying type
- Color correction type
- Tactile type
- Kinesthetic type
- RigidBodyMotion type
Part 2: Control Information

Individual sensor types
- Light sensor type
- Ambient noise sensor type
- Temperature sensor type
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- Force sensor type
- Torque sensor type
- Pressure sensor type
- Motion sensor type
- Intelligent camera type
Part 3: Sensory Information

Normative references
ISO/IEC 15938-5, Information technology — Multimedia content description interface — Part 5: Multimedia description schemes
ISO/IEC 21000-7, Information technology — Multimedia framework (MPEG-21) — Part 7: Digital Item Adaptation

Sensory effects description language (SEDL)
- Declarations
- GroupOfEffects
- Effect
- ReferenceEffect

Sensory effect vocabulary
- Light, colored light, flash light
- Temperature
- Wind
- Vibration
- Water sprayer
- Scent
- Fog
- Shadow
- Color correction
- Kinesthetic
- Tactile
Part 4: Virtual World Object Characteristics

- **Appearance**
  - Contains the high level description of the appearance and may refer to a media containing the exact geometry and texture.

- **Haptics Properties**
  - Contains the high level description of the haptics properties.

- **Animation**
  - Contains the description of a set of animation sequences that the avatar is able to perform and may refer to several medias containing the exact (geometric transformations) animation parameters.

- **Communication Skills**
  - Contains a set of descriptors providing information on the different modalities an avatar is able to communicate.

- **Personality**
  - Contains a set of descriptors defining the personality of the avatar.

- **Control**
  - Contains a set of descriptors defining possible place-holders for sensors on body skeleton and face feature points.
Part 5: Data Formats for Interaction Device

- New part for General uses of Part 2 & 3
- To be discussed in an ad hoc group meeting
Part 6: Reference SW

- Current Status: WD 2.0 of ISO/IEC 23005-6
- Contains only for Part 3 Sensory Information
- Add Reference SW for Part 2 and Part 4
- Consist of the module to parse and validate the tools contained in the individual Part (2/3/4) of the standard.

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Thank you.