**3GPP SA4 Meeting #133e S4-241403r1**

**Online, 19-23 Aug 2024**

**3GPP TSG SA Meeting #104SP-240979**

**Shanghai, CN, 18 - 21 June 2024**

**Source: InterDigital Europe**

**Title: Updated SID on Haptics in 5G Media Services**

**Document for: Agreement**

**Agenda Item: 15.11**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Study on Haptics in 5G Media Services

Acronym: FS\_HapticsMedia

Unique identifier: 1040020

Potential target Release: Rel-19

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  | X |  | X |  |
| No | X |  | X |  | X |
| Don't know |  |  |  |  |  |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
| X | Study  |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
|  |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 1000019 | Study of Avatars in Real-Time Communication Services | May reference haptics requirements |
|  |  |  |
| 430030 | Study on Haptic Services | May reference haptics use cases and requirements |
| 950005 | Study on localized Mobile Metaverse Services | May reference haptics use cases and requirements |

**Dependency on non-3GPP (draft) specification:**

# 3 Justification

Haptic sensors (force, motion, vibration) and haptics hardware market is growing exponentially. In 2022, over 90% of cell phones and game consoles include haptic technologies. Haptics is used for two purposes, for user feedback and as a new media type along with audio and video in immersive or communication experiences.

Today’s communication to/from cell phones is primarily speech and/or video. In addition media streaming services may be provided with audio-visual content from application servers. However, the cellphones have vibrotactile actuators built in. Integrating those actuators into media communication and streaming services on top of displays and speakers is of interest. As of today, the information transmitted for using those actuators is generally proprietary. This is an interoperability issue when exchanging information between devices from different manufacturers or when these devices receive media services that include haptic experiences.

With the emergence of XR devices, the presence of haptics media in an immersive XR experience plays a significant role in improving the sense of presence and immersion. For example, real-time tactile sensations in response to user interactions with virtual objects make the user feel like they are genuinely touching and manipulating the virtual elements. Moreover, users with visual or auditory impairments can still engage with virtual content through haptic feedback.

TR 22.847 studies on supporting tactile and multi-modality communication services while TR 22.856 studies localized Mobile Metaverse Services.. In particular, TR22.847 identifies the 3 following modalities for immersive communications and services: a) video and audio media, b) information perceived by sensors about the environment, e.g. brightness, temperature, humidity, etc., and c) haptic data when touching a surface (e.g., pressure, texture, vibration, temperature), or kinaesthetic senses (e.g. gravity, pull forces, sense of position awareness). Furthermore, the study outlines the requirements for the following use cases:

1. Immersive multi-modal Virtual Reality (VR) application
2. Remote control robot, immersive VR games
3. Support of skillset sharing for cooperative perception and manoeuvring of robots
4. Haptic feedback for a personal exclusion zone in dangerous remote environments
5. Live Event Selective Immersion
6. virtual factory

[Some use cases focus on tactile communication which is out of scope for this study. However, in addition, a subset of these use cases may be of relevance for haptics as a media type and hence be in scope for the work of this study].

[The subset of use-cases focusing on the communication and distribution of haptics data/signals for media and real time communication services are in scope of the study. Robotic, medical and industrial services, described as “Tactile and multimodal communication” in TR22.847 are not in scope]

Furthermore, the potential of haptics media for immersive applications and services has also triggered the work on a new standard ISO/IEC 23090-31 within MPEG WG07 that specifies a coded representation of haptics covering a large range of use cases and taking into account device constraints to facilitate fast market adoption and deployment. The Draft International Standard (DIS) version of the specification was released in 2023, and the standard is expected to be published in 2024. Other organizations such as IEEE and Khronos have similar work on the standardization of different aspects of haptics.

The focus of this study is the potential integration of haptics media in 3GPP communication and streaming services.

# 4 Objective

The study aims to investigate and identify the integration of haptics media in 3GPP communication and streaming services, including the identification of haptics input and representation formats, potential compression formats of haptics media, the integration into delivery systems, as well as QoE aspects.

The main objectives of this study include:

- Identify relevant use cases and requirements already defined in TR 22.847, TR 22.856 related to the integration of haptics into media streaming and communication services, and refine them as necessary.

- Collect and documentmarket- and technologies (for example existing APIs)providing

- Collect and describe the candidate input and representation formats for haptic experience, relevant to the above use cases and device types.

- Define relevant QoE metrics for suitable haptics experiences

- Identify 3GPP streaming and communication services that may benefit from the haptics media type and identify the gaps and requirements need to integrate haptics experiences.

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Identify candidate technologies that address the gaps including digital representation and compression formats, transport formats and potential QoS requirements in context with the services.

- Provide potential needs and benefits for normative work

Coordinated with external organizations that address haptics media, including MPEG, IEEE and Khronos as necessary.

# 5 Expected Output and Time scale

|  |
| --- |
| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| *TR* | *26.854* | *Study on Haptics in 5G Media Services* | *SA#106* | *SA#107* | *Gaëlle Martin-Cocher, InterDigital (Gaelle.Martin-Cocher@InterDigital.com)* |

Allocated TR 26.854 is an internal Technical Report.

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
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# 6 Work item Rapporteur(s)

*Gaëlle Martin-Cocher, InterDigital (Gaelle.Martin-Cocher@InterDigital.com)*

# 7 Work item leadership

SA4

# 8 Aspects that involve other WGs

# 9 Supporting Individual Members

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| Supporting IM name |
| InterDigital Europe |
| Tencent |
| Vodafone |
| Vivo |
| Nokia Corporation |
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