**3GPP TSG-SA WG4 Meeting #131-bis-eS4-250527**

**Online, 11 – 17 April, 2025**

**Source: InterDigital Canada**

**Title: [FS\_ARSpatial] Pseudo-CR on Proposed Conclusions**

**Spec: 3GPP TR 26.819 v0.3.0**

**Agenda item: 9.8**

**Document for: Agreement**

**1. Introduction**

The Study on Spatial Computing for AR Services (FS\_ARSpatial) was approved during SA#104 meeting. The objectives of the study include identifying where spatial computing functions run and which media, metadata, and description formats are used for exchange between these elements based on the architecture defined in the TS 26.506, notably in split processing scenarios.

**2. Reason for Change**

Clause 8.1 on Conclusions for spatial computing is currently empty. This document provides a summary of the studies and identifies the next steps related to the Spatial Computing for AR Services as a conclusion of this TR.

**3. Proposal**

It is proposed to agree the following changes to 3GPP TR 26.819 v0.3.0.

\* \* \* First Change \* \* \* \*

# 8 Conclusions and proposed next steps

## 8.1 Conclusions

 Augmented reality (AR) composites virtual objects with reality. Knowledge of the real world is essential for the localization of the AR device and for a seamless insertion of virtual content into the user’s real environment. The generation of information about the real world from the processing of sensor data may be done on the UE or delegated to a server in some cases for a number of reasons (e.g., in the case of UE devices with limited computational capabilities or low battery levels, the need for a central network function in some multi-user applications, etc.).

To support such Spatial Computing services, the following aspects have been documented in this report:

- A set of relevant Spatial Computing functions have been identified based a number of AR use cases. For each Spatial Computing function, the input sensor data and the output Spatial Description are identified. Some examples of Spatial Description formats have also been documented.

- A number of existing Quality-of-Experience (QoE) metrics have been identified as relevant for Spatial Computing services and a mapping of these QoE metrics to the Spatial Computing functions has been documented. In particular, the anchoring and re-localization functions are mapped to the relevant metrics but no QoE metrics or delay requirements and constraints have been documented for other functions. Additional mappings and requirements may be further studied in the future.

- The related standardization works in 3GPP and other standardization bodies and the relevant of these works to Spatial Computing services in general, and the spatial computing functions identified in this report in particular, has been studied, leading to the identification of some gaps:

- Some functions are not well addressed, in particular 3D model reconstruction, segmentation and labelling, light extraction, and collider generation, described in clause 4.2, as existing standardization works mainly address the world tracking (e.g., in ETSI ARF), re-localization, and anchoring functions (e.g., in ETSI ARF and TS 23.437).

- The UE device capabilities related to Spatial Computing is not defined in TS 26.119. This can include capabilities on the supported spatial computing functions, spatial description formats, and, based on the device capabilities, the format for requests and metadata for in-network support for spatial computing functions.

- The support of AR is not addressed in a split rendering architecture as specified in TS 26.565

## - The mapping to 5G services. A spatial computing architecture is provided based on the reference architecture for Media Delivery (clause 4.1.2.2 of TS 26.506). Call flows for spatial computing session set-up and operation involving a Spatial Computing client and the remote Spatial Computing functions located in a Media Application Server are also described.8.2 Proposed next steps

 [Based on the details in the report, the two following normative works are identified in Release 20 for an AR Service Enabler:

- For the production of a persistent real-world representation from UE sensor data. This real-word representation may include a feature map, anchoring information, segmented and labeled 3D models, and lighting information.

- Specify the sensor data signaling and negotiation

- Select interoperable formats for the sensor data

- Define the support of the configuration, compression, and delivery of sensor data

- For the real-time consumption of real-world representation for interactive AR applications. The re-localization, anchoring, 3D models, and lighting information need to be delivered in real-time for the localization of the AR device and for a seamless insertion of virtual content into the user’s real environment. Both split and non-split rendering architectures are considered.

- Add UE Spatial Computing capabilities in TS 26.119

- Add the support of AR profile in TS 26.565 for the split rendering architecture

- Select interoperable formats

- Specify procedures, flows, configuration, and transport protocols]

\* \* \* End of Changes \* \* \* \*