3GPP TSG SA WG4 Meeting #120eS4-221037r01

17th – 26th August 2022

**Source:** Samsung Electronics Co., Ltd.

**Title:** On MR split rendering information

**Document for** Discussion and Agreement

**Agenda item** 9.5

# Introduction

Mixed Reality split rendering is believed to present a richer experience in addition to the AR split rendering in the sense of enabling use cases like virtual objects hit and bounce off from a wall, virtual participants occluded by a desk in a multi-party call, or decorate a real room with virtual party supplies, based on occlusion and interaction effect with real surroundings of a user.

The PD text for MeCAR groups the media capability of the terminal into categories such as camera, video, and runtime in clause 5.1. Clause 5.2 provides 2D media oriented capabilities for the video category. Clause 6.2 provides view-related information as data types relates to Sensor and user environment data types. Currently there is no explicit information or data type relates to user surroundings.

A MR renderer should require 3D geometry data describing a user's surroundings to customise rendered view to be fit and interact with real environments. A terminal may identify its capability on generating user surroundings with available data type such as 2D RGB, depth, point cloud, mesh and etc.

This contribution proposes parameters identifying capability of a terminal on providing user surroundings data. Additionally, parameters on identifying data type of the user surroundings are proposed. MR split rendering service provider may determine AR-only or MR-enabled service for a terminal with the capability then provision relevant processes.

# Proposed information for MR split rendering

6.X User surroundings information

The device may acquire, generate, and encode data stream related to user's surrounding geometry. The capability on the user surrounding data and its data type is listed as follows.

* Device capability on user surroundings
  + acquire raw data
  + acquire and generate 3D geometry data
  + acquire, generate and encode 3D geometry data
* User surrounding data
  + Raw data
    - RGB
    - Depth
  + 3D geometry data
    - point cloud
    - mesh
    - scene description
* Property of the user surroundings
  + "All data": A device can repeatedly evaluate 3D geometry data with newly processed data and adjust, invalidate, or register new nodes. "All Data" indicates that the 3D geometry data contains all the geometry currently recognized and tracked by the device.
  + "In the latest view frustum": Of the "all" 3D geometry data, only those belonging to a space that matches the most recent view information (includes the latest pose and view frustum information) are "In the latest view frustum".
  + "Recent update": Only 3D geometry data that has been updated since the last transmission is referred to as "Recent updates".
  + "Satisfying confidence level": Each point or node of 3D geometry data has a different level of confidence in whether something exists in that location. The only 3D geometry data that satisfies a certain confidence level are distinguished by the property of the "Satisfying confidence level".

Note) User surroundings can be a 3D geometry data, or raw data with corresponding information enough to generate the 3D geometry data.

Note) The properties describe 3D geometry data.

# Proposal

We propose to consider user surrounding information in clause 2 and document it in the 6. Sensor and user environment section of PD for MeCAR.