



# **JCTVC-G079: SEI message for display orientation information**

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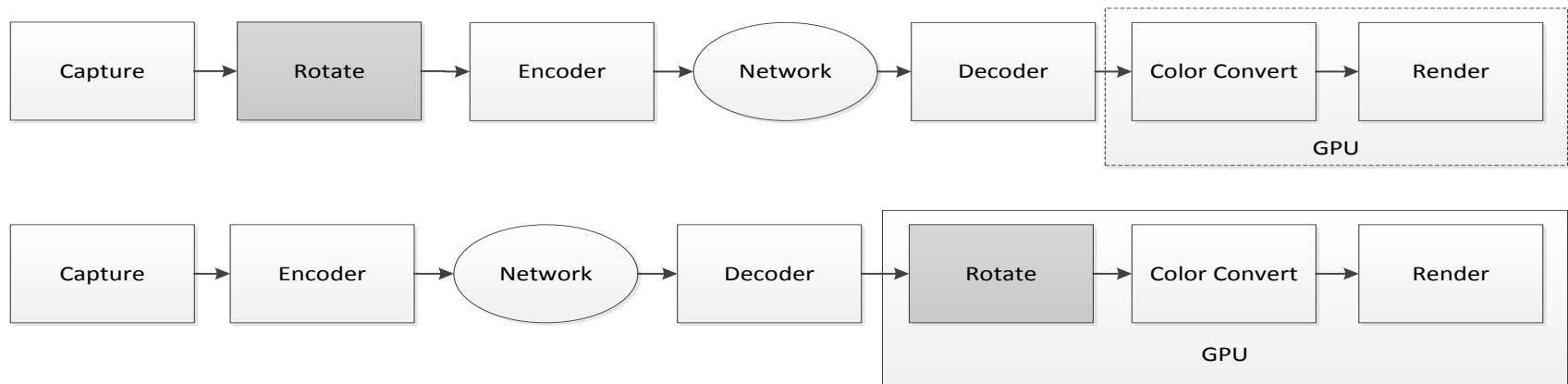


# Picture Orientation Information

- This contribution proposes an SEI message to both AVC/H.264 and to the HEVC design to allow orientation to change on a picture-by-picture basis, following decoding
  - Concept originally proposed for HEVC in JCTVC-E280
  - Discussed with additional normative alternatives in JCTVC-F291
    - Consensus of group to prefer non-normative SEI message approach. Quote from Torino meeting report: *"It was remarked that a flip bit may also be beneficial to add in such an SEI message. We are favorably inclined to add an SEI message such as this, but it is not our priority at the moment."*
- Re-proposed now because of possible H.264/AVC amendment for a different SEI message change

# Motivation

- Some video capturing devices can capture pictures in orientation different from the rendering/display orientation
  - Orientation may change at any time
- Rotation can be performed at the capturing end, prior to encoding, or at the display end, after decoding
  - Can take advantage of GPUs



# display\_orientation SEI message

- **Flip flag**
- **Arbitrary rotation in degrees**
  - Decoders free to round to nearest 90 degrees
- **display\_orientation\_repetition\_period** usage similar to repetition period found in other SEI messages

# Proposed syntax & semantics

display_orientation_ ( payloadSize ) {	Descriptor
x_flip	u(1)
rotate_deg	ue(v)
display_orientation_repetition_period	ue(v)
}	

**x\_flip** equal to 1 specifies that the decoded picture shall be flipped horizontally for display. x\_flip equal to 0 specifies that the decoded picture shall not be flipped horizontally.

If x\_flip is equal to 1, then the decoded picture is flipped as follows:

For each color component  $Z = L, Cb, \text{ and } Cr$

Let  $d_z$  be the final array of samples to be displayed for the component  $Z$ .

For  $x = 0 \dots \text{PicWidthInSamples}_z$  and  $y = 0 \dots \text{PicHeightInSamples}_z$

$$d_z[x, y] = s'_z[\text{PicWidthInSamples}_z - x - 1, y]$$

**rotate\_deg** specifies the clockwise rotation of the decoded picture (after applying horizontal flipping when x\_flip is set) in degrees. rotate\_deg shall be in the range of 0 to 359, inclusive

# Conclusions

- Recommend
  - Add SEI message in next amendment to AVC/H.264
  - Add SEI message to HEVC design