V4L2_META_FMT_VSP1_HGT ('VSPT')

Renesas R-Car VSP1 2-D Histogram Data

Description

This format describes histogram data generated by the Renesas R-Car VSP1 2-D Histogram (HGT) engine.

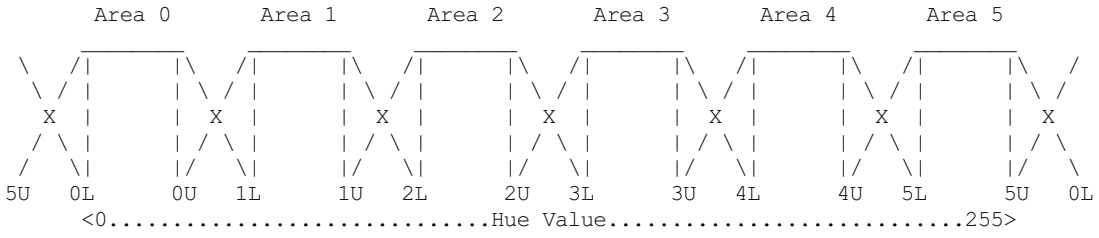
The VSP1 HGT is a histogram computation engine that operates on HSV data. It operates on a possibly cropped and subsampled input image and computes the sum, maximum and minimum of the S component as well as a weighted frequency histogram based on the H and S components.

The histogram is a matrix of 6 Hue and 32 Saturation buckets, 192 in total. Each HSV value is added to one or more buckets with a weight between 1 and 16 depending on the Hue areas configuration. Finding the corresponding buckets is done by inspecting the H and S value independently.

The Saturation position **n** (0 - 31) of the bucket in the matrix is found by the expression:

n = S / 8

The Hue position **m** (0 - 5) of the bucket in the matrix depends on how the HGT Hue areas are configured. There are 6 user configurable Hue Areas which can be configured to cover overlapping Hue values:



When two consecutive areas don't overlap (n+1L is equal to nU) the boundary value is considered as part of the lower area.

Pixels with a hue value included in the centre of an area (between nL and nU included) are attributed to that single area and given a weight of 16. Pixels with a hue value included in the overlapping region between two areas (between n+1L and nU excluded) are attributed to both areas and given a weight for each of these areas proportional to their position along the diagonal lines (rounded down).

The Hue area setup must match one of the following constrains:

```
0L <= 0U <= 1L <= 1U <= 2L <= 2U <= 3L <= 3U <= 4L <= 4U <= 5L <= 5U

0U <= 1L <= 1U <= 2L <= 2U <= 3L <= 3U <= 4L <= 4U <= 5L <= 5U <= 0L
```

Byte Order. All data is stored in memory in little endian format. Each cell in the tables contains one byte.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\linux-master\Documentation\userspace-api\media\v4l\[linux-master][Documentation][userspace-api][media][v4l]pixfmt-meta-vsp1-hgt.rst, line 82)

Unknown directive type "flat-table".

```
.. flat-table:: VSP1 HGT Data - (776 bytes)
    :header-rows:  2
    :stub-columns: 0

    * - Offset
      - :cspan:`4` Memory
    * -
      - [31:24]
      - [23:16]
      - [15:8]
      - [7:0]
    * - 0
      - -
      - S max [7:0]
      - -
      - S min [7:0]
    * - 4
      - :cspan:`4` S sum [31:0]
    * - 8
      - :cspan:`4` Histogram bucket (m=0, n=0) [31:0]
    * - 12
```

```
  - :cspan:`4` Histogram bucket (m=0, n=1) [31:0]
* -
  - :cspan:`4` ...
* - 132
  - :cspan:`4` Histogram bucket (m=0, n=31) [31:0]
* - 136
  - :cspan:`4` Histogram bucket (m=1, n=0) [31:0]
* -
  - :cspan:`4` ...
* - 264
  - :cspan:`4` Histogram bucket (m=2, n=0) [31:0]
* -
  - :cspan:`4` ...
* - 392
  - :cspan:`4` Histogram bucket (m=3, n=0) [31:0]
* -
  - :cspan:`4` ...
* - 520
  - :cspan:`4` Histogram bucket (m=4, n=0) [31:0]
* -
  - :cspan:`4` ...
* - 648
  - :cspan:`4` Histogram bucket (m=5, n=0) [31:0]
* -
  - :cspan:`4` ...
* - 772
  - :cspan:`4` Histogram bucket (m=5, n=31) [31:0]
```