一步一步解析H.264码流的NALU(SPS,PSS,IDR)获取宽高和帧率

分析H.264码流的工具

CodecVisa，StreamEye以及VM Analyzer

NALU是由NALU头和RBSP数据组成，而RBSP可能是SPS，PPS，Slice或SEI

而且SPS位于第一个NALU，PPS位于第二个NALU

另外值得说一下的就是从Headers Info拷贝出来的数据当中"na"就是未定义的，也就是if条件没有覆盖的情况。

sps

pic_width_in_mbs_minus1 = 21

pic_height_in_mbs_minus1 = 17

分别表示图像的宽和高，以宏块(16x16)为单位的值减1

因此，实际的宽为(21+1)*16 = 352

以上是针对宽高是16的整数倍的情况，当不是16整数倍时，frame_cropping_flag值为1，frame_mbs_only_flag为1，公式如下：

// 宽高计算公式

```
width = (sps->pic_width_in_mbs_minus1+1) * 16;
height = (2 - sps->frame_mbs_only_flag)* (sps->pic_height_in_map_units_minus1 +1) * 16);
if(sps->frame_cropping_flag)
{
unsigned int crop_unit_x;
unsigned int crop_unit_y;
if (0 == sps->chroma_format_idc) // monochrome
{
crop_unit_x = 1;
crop_unit_y = 2 - sps->frame_mbs_only_flag;
}
else if (1 == sps->chroma_format_idc) // 4:2:0
{
crop_unit_x = 2;
crop_unit_y = 2 * (2 - sps->frame_mbs_only_flag);
}
else if (2 == sps->chroma_format_idc) // 4:2:2
{
crop_unit_x = 2;
crop_unit_y = 2 - sps->frame_mbs_only_flag;
}
else // 3 == sps.chroma_format_idc // 4:4:4
{
crop_unit_x = 1;
crop_unit_y = 2 - sps->frame_mbs_only_flag;
}
width -= crop_unit_x * (sps->frame_crop_left_offset + sps->frame_crop_right_offset);
height -= crop_unit_y * (sps->frame_crop_top_offset + sps->frame_crop_bottom_offset);
}
```

ff_h264_decode_seq_parameter_set

ff_h264_decode_picture_parameter_set

https://cardinalpeak.com/blog/the-h-264-sequence-parameter-set/

最好参考:H.264官方中文版.pdf7.3.2.1节对比查看

Parameter Name	Type	Value	Comments
forbidden_zero_bit	u(1)	0	Despite being forbidden, it must be set to 0!
nal_ref_idc	u(2)	3	3 means it is "important" (this is an SPS)
nal_unit_type	u(5)	7	Indicates this is a sequence parameter set
profile_idc	u(8)	66	Baseline profile
constraint_set0_flag	u(1)	0	We're not going to honor constraints
constraint_set1_flag	u(1)	0	We're not going to honor constraints
constraint_set2_flag	u(1)	0	We're not going to honor constraints
constraint_set3_flag	u(1)	0	We're not going to honor constraints
reserved_zero_4bits	u(4)	0	Better set them to zero
level_idc	u(8)	10	Level 1, sec A.3.1
seq_parameter_set_id	ue(v)	0	We'll just use id 0.
log2_max_frame_num_minus4	ue(v)	0	Let's have as few frame numbers as possible
pic_order_cnt_type	ue(v)	0	Keep things simple
log2_max_pic_order_cnt_lsb_minus4	ue(v)	0	Fewer is better.
num_ref_frames	ue(v)	0	We will only send I slices
gaps_in_frame_num_value_allowed_flag	u(1)	0	We will have no gaps
pic_width_in_mbs_minus_1	ue(v)	7	SQCIF is 8 macroblocks wide
pic_height_in_map_units_minus_1	ue(v)	5	SQCIF is 6 macroblocks high
frame_mbs_only_flag	u(1)	1	We will not to field/frame encoding
direct_8x8_inference_flag	u(1)	0	Used for B slices. We will not send B slices
frame_cropping_flag	u(1)	0	We will not do frame cropping
vui_prameters_present_flag	u(1)	0	We will not send VUI data
rbsp_stop_one_bit	u(1)	1	Stop bit. I missed this at first and it caused me much trouble.

ff_h264_decode_seq_parameter_set解析:

skip_bits(&h->gb, 2);跳过两个位，表现为GetBitContext.index后移两个位置。

- 当前SPS的帧的宽 = (sps_info.pic_width_in_mbs_minus1 + 1) * 16
- 当前SPS的帧的高 = (sps_info.pic_height_in_map_units_minus1 + 1) * 16

extract the h.264 NAL units from the file using ffmpeg:

```
ffmpeg.exe -i Old Faithful.mp4 -vcodec copy -vbsf h264_mp4toannexb -an of.h264
```

获取帧率

https://github.com/leixiaohua1020/simplest_librtmp_example/blob/master/simplest_librtmp_send264/sps_decode.h

fps=time_scale/(2*num_units_in_tick);

30/(2*1)=15fps .

https://github.com/leixiaohua1020/h264_analysis

参考:

http://www.latelee.org/my-study/get-width-height-framerate-from-bitstream.html宽高计算公式

原文地址：https://www.cnblogs.com/elesos/p/7569363.html

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