Event-Based Vision Camera

SilkyEvCam

Material of Biases of Parameter in the software framework

This material has been created based on our interpretation of the product of Prophesee's software framework to enhance user convenience. Please note that this is has not been supervised by Prophesee. For the official use, please refer to Prophesee's official website (https://www.prophesee.ai/).

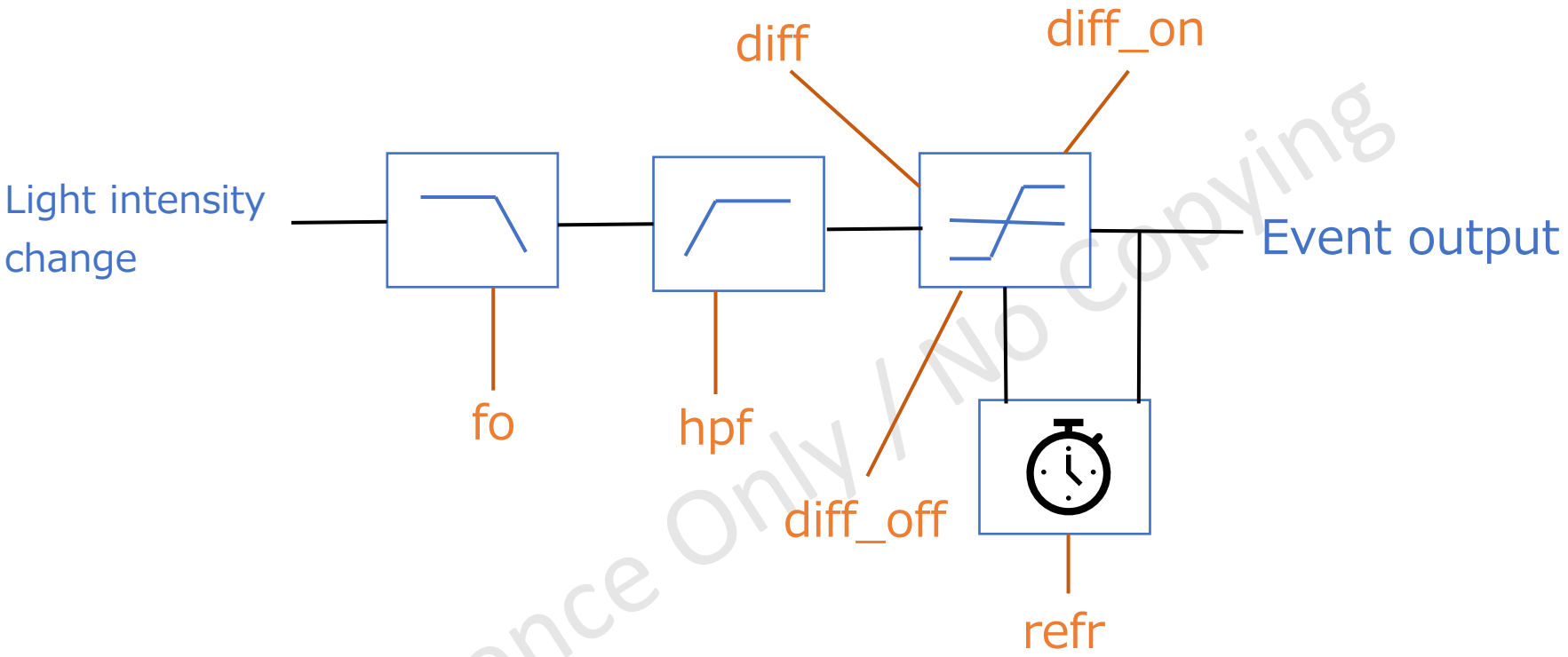
・Overview of Bias

The following is an overview of the bias settings that can be made when shooting with SilkyEvCam.

This section describes the implications of the setting rather than the accuracy of the physical description in the sensor device.

Please check the Prophesee website below which provides the details of the bias.

https://docs.prophesee.ai/4.6.2/hw/manuals/biases.html
IMX636 and Gen3.1 settings on the website apply to SilkyEvCam HD and SilkyEvCam VGA respectively.

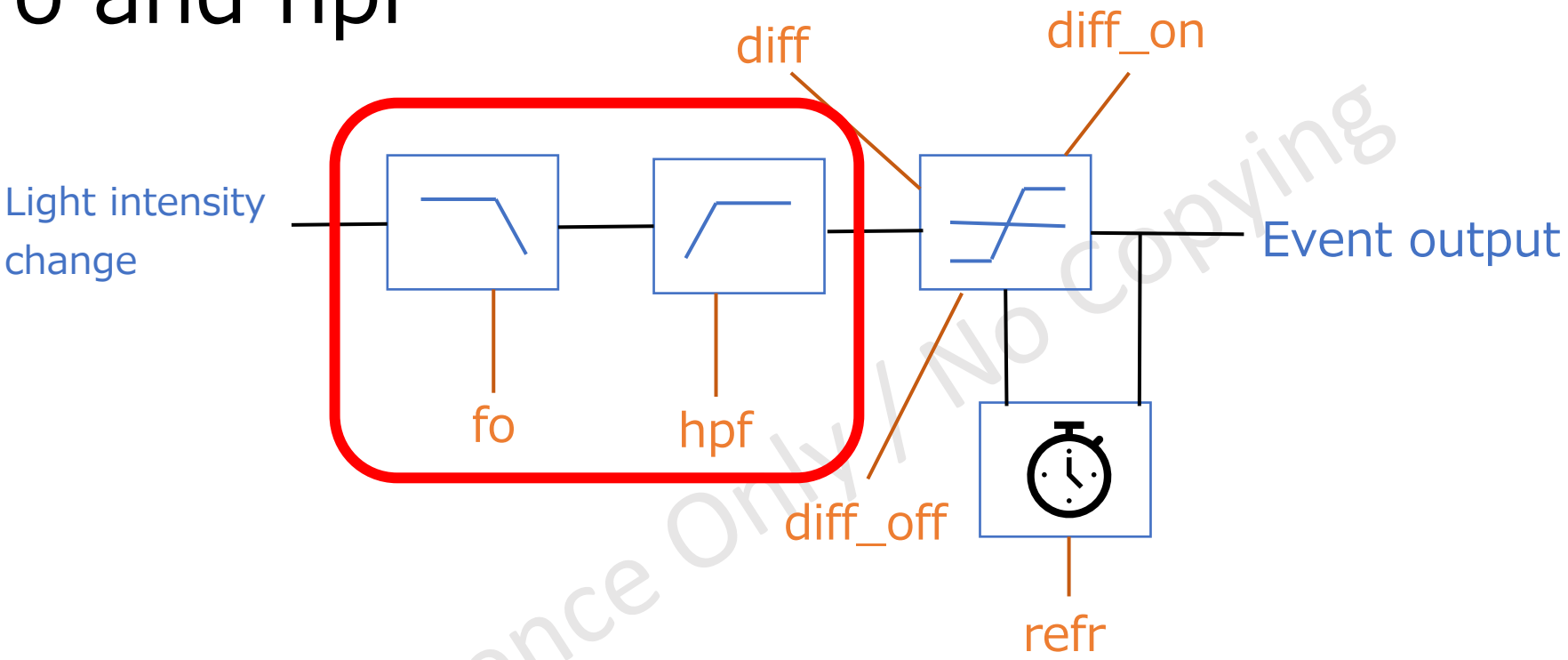


Schematic Illustrations of Each Setting Value of Bias

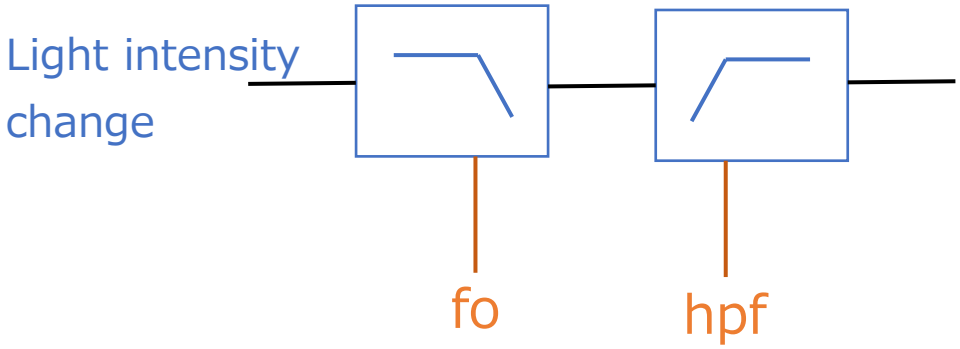
This is the schematic illustrations of the bias setting involved in the sensor, from the light intensity change situation to the event output. The following pages provided explanations for each setting value.

Note that the explanation is based on about SilkyEvCam HD, unless otherwise specified.

fo and hpf



Schematic Illustrations of Each Setting Value of Bias



fo is not exactly a filter in practice;

it seems to adjust the latency of light intensity changes.

Reducing the fo value results in slower latency.

fo corresponds to the cutoff frequency setting of the LowPassFilter.

fo value decreases = the cutoff frequency becomes lower = the bandwidth becomes narrower

= noise decreases

hpf corresponds to the cutoff frequency setting of the HighPassFilter

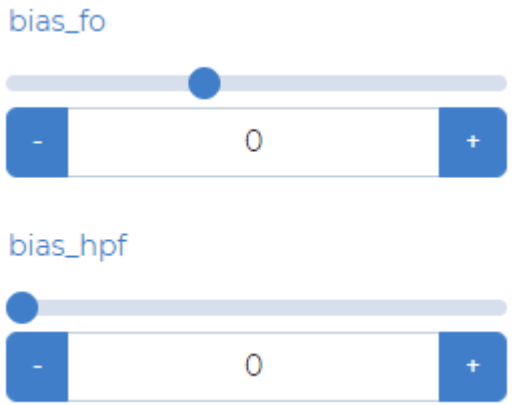
hpf value increases = the cutoff frequency becomes higher= the bandwidth becomes narrower

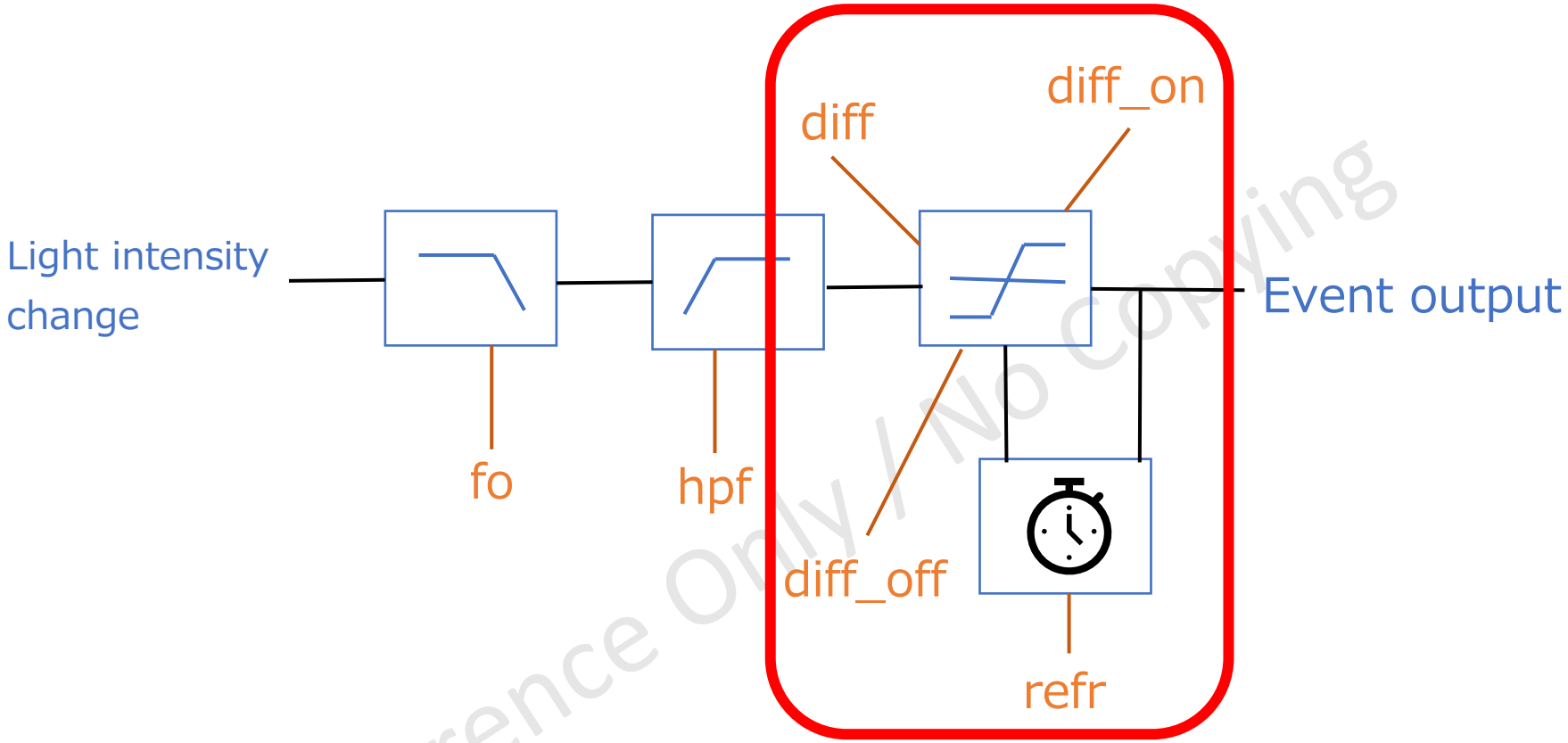
= noise decreases

Conversely, in the case of SilkyEvCam VGA,

fo value increases = the cutoff frequency becomes lower

hpf value decreases= the cutoff frequency becomes higher

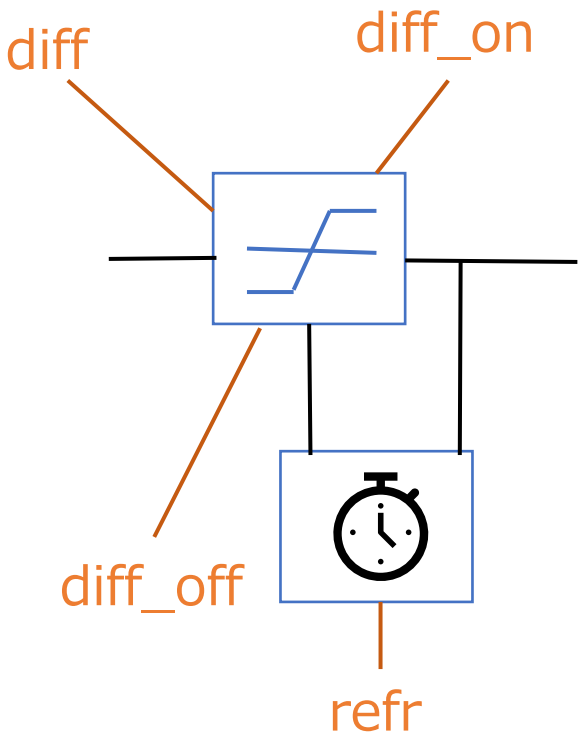


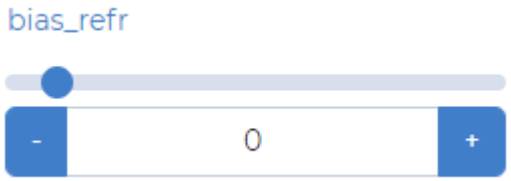


Schematic Illustrations of Each Setting Value of Bias

About diff, diff_on, diff_off, and refr

Overview of Bias: diff, diff_on, diff_off, and refr





diff corresponds to Reference value.

This value is recommended to remain unchanged.

diff_on is the threshold for outputting plus event.

diff_off is the threshold for outputting minus event.

(The details will be provided on the next page.)

refr sets the dead time (inactive period; the period between outputting an event and starting the detection of the next event)

In the case of SilkyEvCam HD, the dead time becomes longer when decreasing refr.

When the dead time becomes longer, the number of event tends to decrease so that in situation where a large number of events are occurring, reducing refr maybe able to suppress the number of events.

In contrast, when the refr increases, the dead time becomes longer on SilkyEvCam VGA.

- Biases (diff_on, diff_off)

https://docs.prophesee.ai/stable/hw/manuals/biases.html

In the case of SilkyEvCam HD :

Increase diff_on value＝ （Plus event） Noise decreases

＝Increases the difference from the reference value, events (Plus event) become less likely to occur when the brightness increases.

＝Noise decreases＝Sensitivity decreases when the brightness increases.

Increase diff_off value＝ （Minus event） Noise decreases

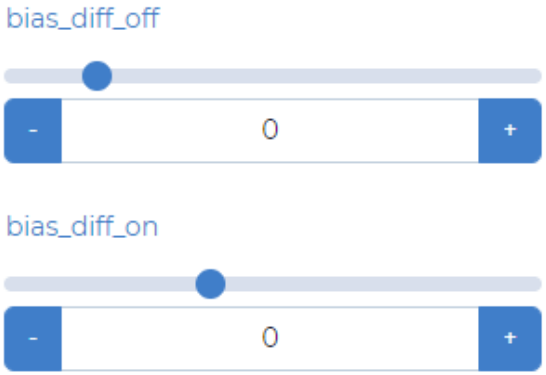
＝Increases the difference from the reference value, events (Minus event) become less likely to occur when the darkness increases.

＝ Noise decreases=Sensitivity decreases when the darkness increases.

In contrast

As diff_on rate decreases＝Sensitivity increases when the brightness increases.

As diff_off rate decreases= Sensitivity increases when the darkness increases.



In the case of SilkyEvCam VGA :

Not in relative values from zero, but in voltage values (mV),

diff_off rate decreases = (minus event) noise decreases