

# Technical control: timeBOX

08/12/2014 - 09/12/2014 AiryLab (Greoux-les-Bains, France)

## Test #1

Software: Genika Trigger.

Camera: Basler 1300-60gm at 300 fps (Gigabit Ethernet).

Computer: Lenovo ThinkPad (Intel core i7).

Time Synchronization: timeBOX, Computer time (mode) and continuous PC time synchronization.

Properties: Synchronize every 30 seconds, Tolerance 4 STD (2.5 milliseconds) and Corrected after 5 values above tolerance.

Description: The PC time was continuously synchronized (UTC time) as described. Genika Trigger saved and dated the firing of each PPS LED. The difference between the PC-time and the start of the PPS LED pulse was measured (n=1616, milliseconds) and the results analyzed using R Statistical Software.

Results:

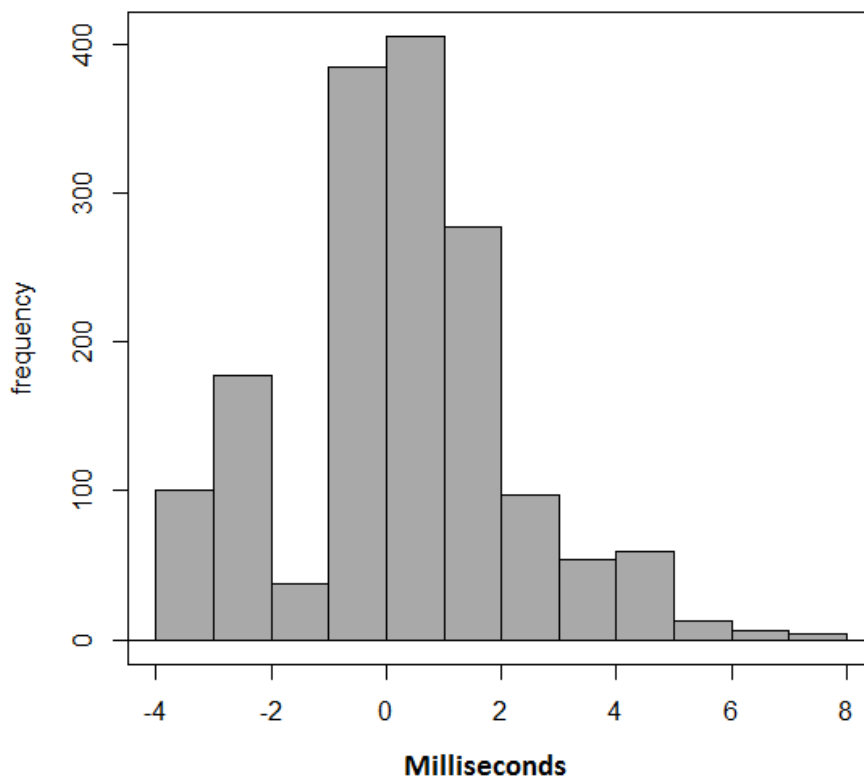
Mean	STD	IQR	0%	25%	50%	75%	100%	n
0.7431931	2.025293	2	-4	0	1	2	8	1616

Min = -4; Max = 8

One Sample t-Test

t = 14.7514, df = 1615, p-value < 2.2e-16

95 percent confidence interval: 0.6443740 ≥ **0.7431931** ≤ 0.8420122



Values inside 95% Interval of Confidence (2xSTD): -3.3073929 ≥ **0.7431931** ≤ 4.7937791

**Camera Jitter at 300 fps = 3.33 milliseconds**

## Test #2

Software: Genika Trigger.

Camera: Basler 1300-60gm triggered by PPS pulse (Gigabit Ethernet).

Computer: Lenovo ThinkPad (Intel core i7).

Time Synchronization: timeBOX, Computer time (mode) and continuous PC time synchronization.

Properties: Synchronize every 30 seconds, Tolerance 4 STD (2.5 milliseconds) and Corrected after 5 values above tolerance.

Description: The PC time was continuously synchronized (UTC time) as described. Genika Trigger dated the frame triggered by each PPS pulse (5 volts,  $\geq 4$  microSec UTC). The difference between the synchronized PC-time and the PPS pulse was measured (n=3485, milliseconds) and the results analyzed using R Statistical Software (version 3.1.0).

Results:

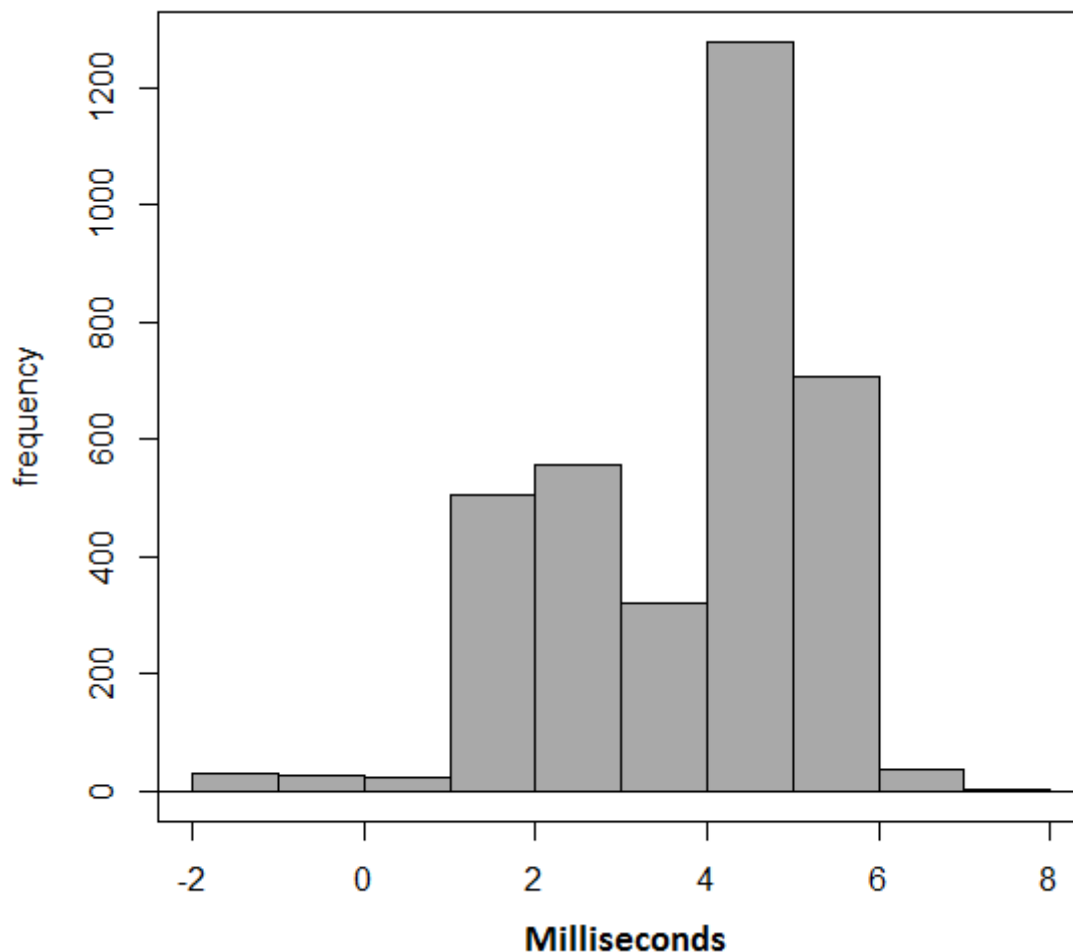
Mean	STD	IQR	0%	25%	50%	75%	100%	n
4.256815	1.561148	2	-2	3	5	5	8	3458

Min = -2; Max = 8

One Sample t-Test

t = 160.9689, df = 3484, p-value < 2.2e-16

95 percent confidence interval:  $4.204966 \geq 4.256815 \leq 4.308664$



Values inside 95% Interval of Confidence (2xSTD):  $1.134519 \geq 4.256815 \leq 7.372296$