

# A Comprehensive Study of Characterizing Program Execution Time

Young-Kyoon Suh

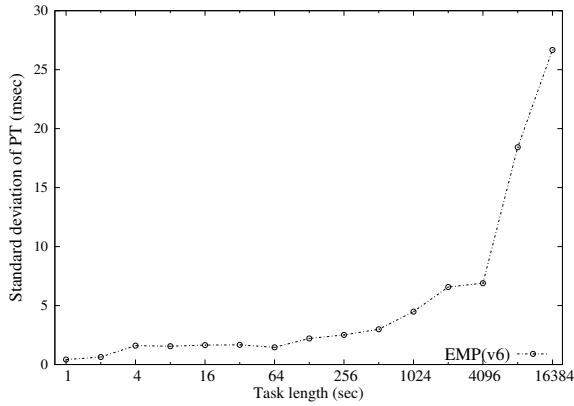
March 3, 2017

## 1 Experiment Notes

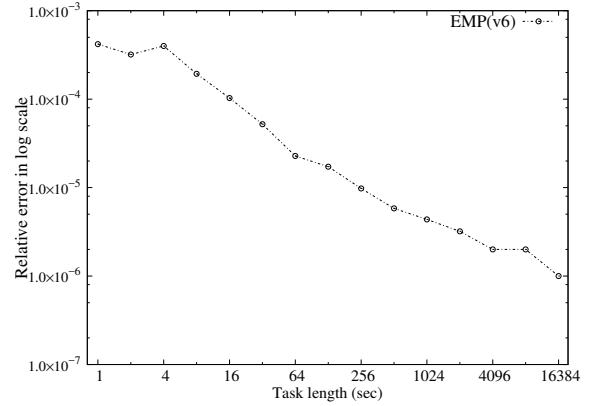
Machine	Task Length (sec)	Description	Experiment Period
sodb12	1~64	Each run with 1000 samples	2013-10-14 ~ 2013-10-15
	128~2048	Each with 300 samples	2013-12-12 ~ 2013-12-21
	4096	A run of 300 samples	2014-06-23 ~ 2014-07-10
	8192	A run of 40 samples	2015-04-23 ~ 2015-04-27
	16384	A run of 40 samples	2015-04-23 ~ 2015-04-23

Table 1: Notes on experiment runs used for histograms

## 2 Measurement Quality



(a) Standard Deviations of PT



(b) Relative Errors of PT

Figure 1: Measurement quality of EMP over increasing task length of a program-under-test (named INC)

### 3 Histograms on the EMPv5 Data

The base data of the following histograms are from Table 1.

#### 3.1 ET

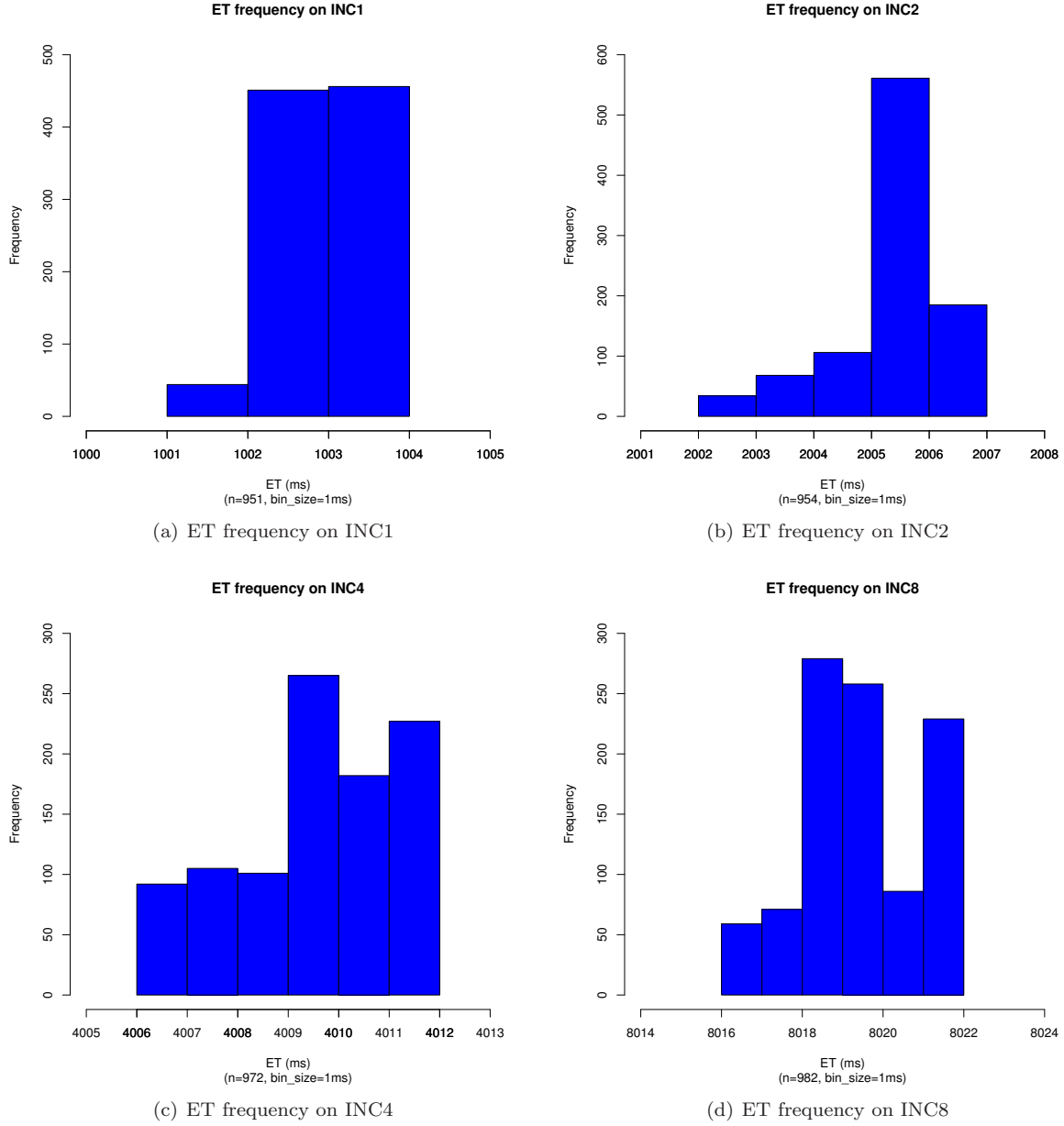
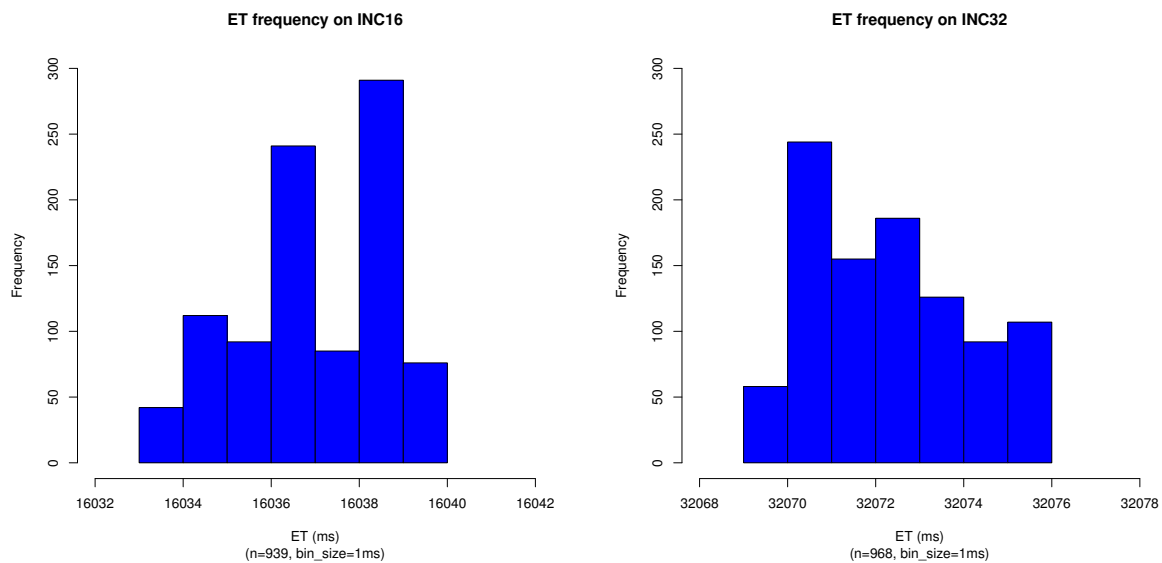
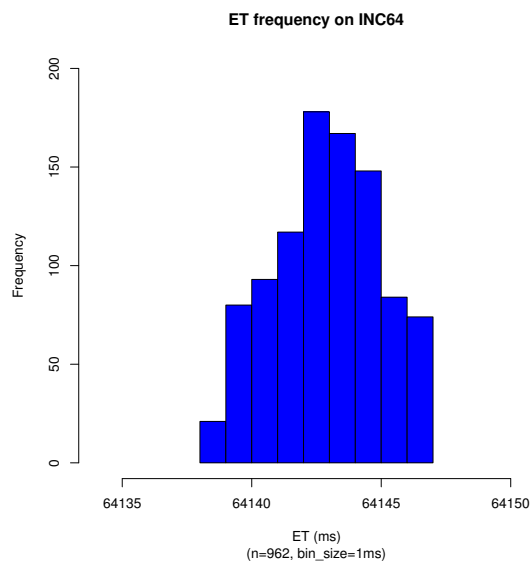


Figure 2: ET Histograms of INC1 ... INC8



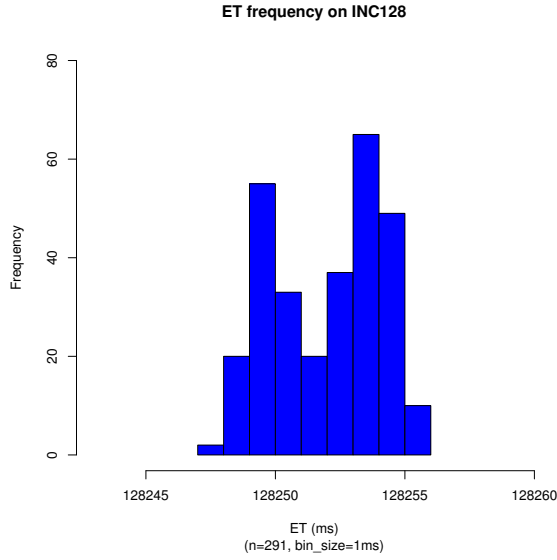
(a) ET frequency on INC16

(b) ET frequency on INC32

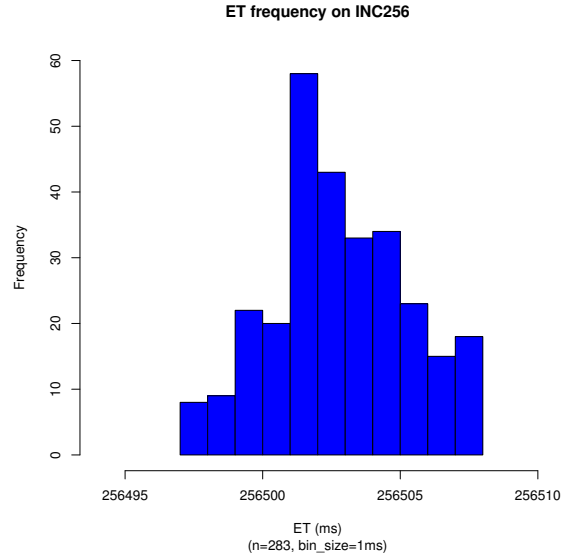


(c) ET frequency on INC64

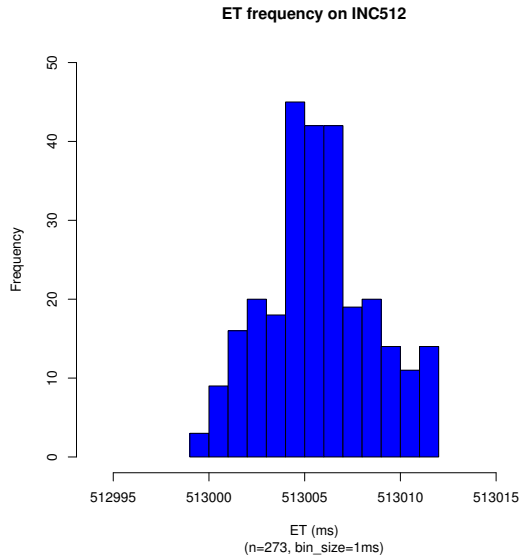
Figure 3: ET Histograms of INC16 ... INC64



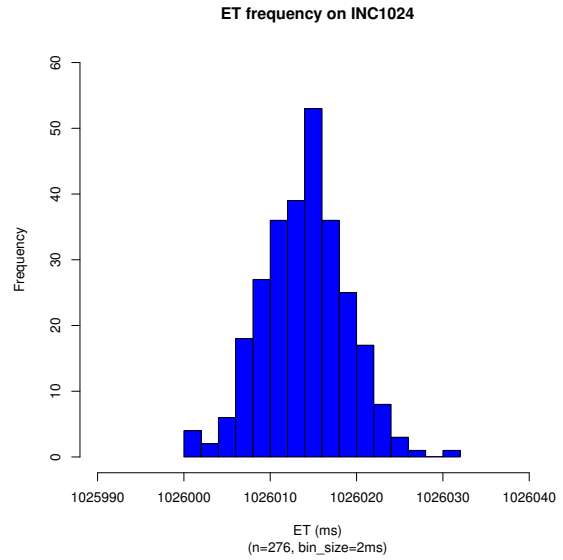
(a) ET frequency on INC128



(b) ET frequency on INC256

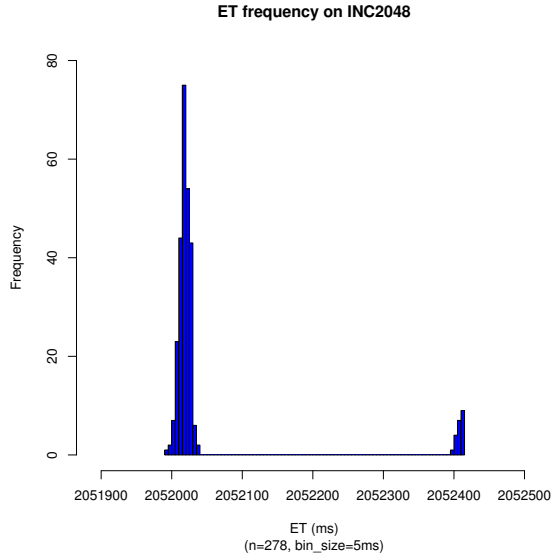


(c) ET frequency on INC512

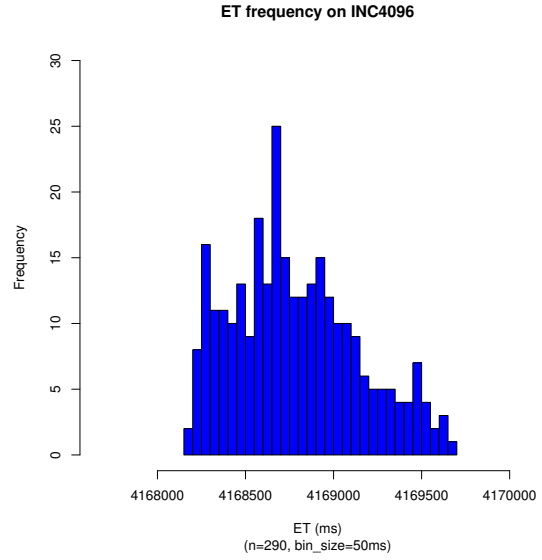


(d) ET frequency on INC1024

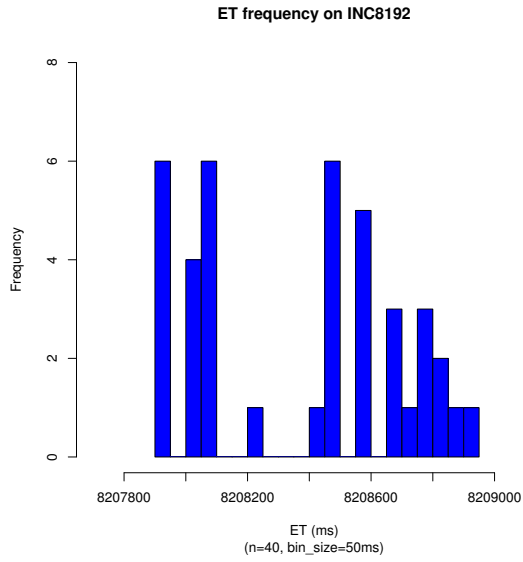
Figure 4: ET Histograms of INC128 ... INC1024



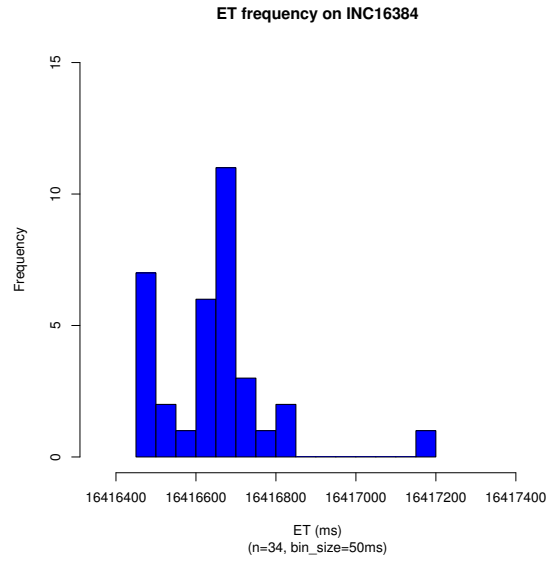
(a) ET frequency on INC2048



(b) ET frequency on INC4096



(c) ET frequency on INC8192



(d) ET frequency on INC16384

Figure 5: ET Histograms of INC2048 ... INC16384

## 3.2 PT

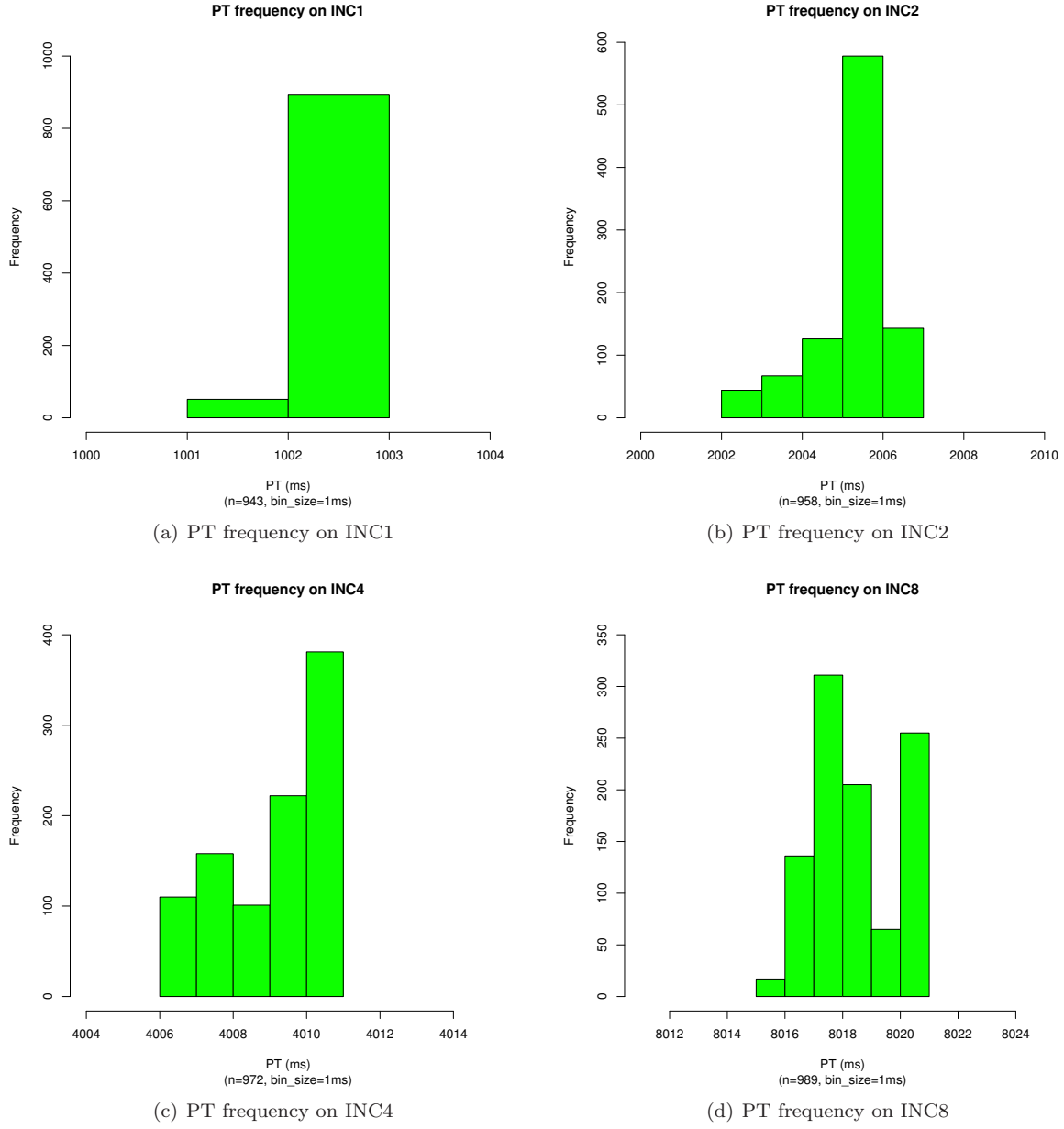
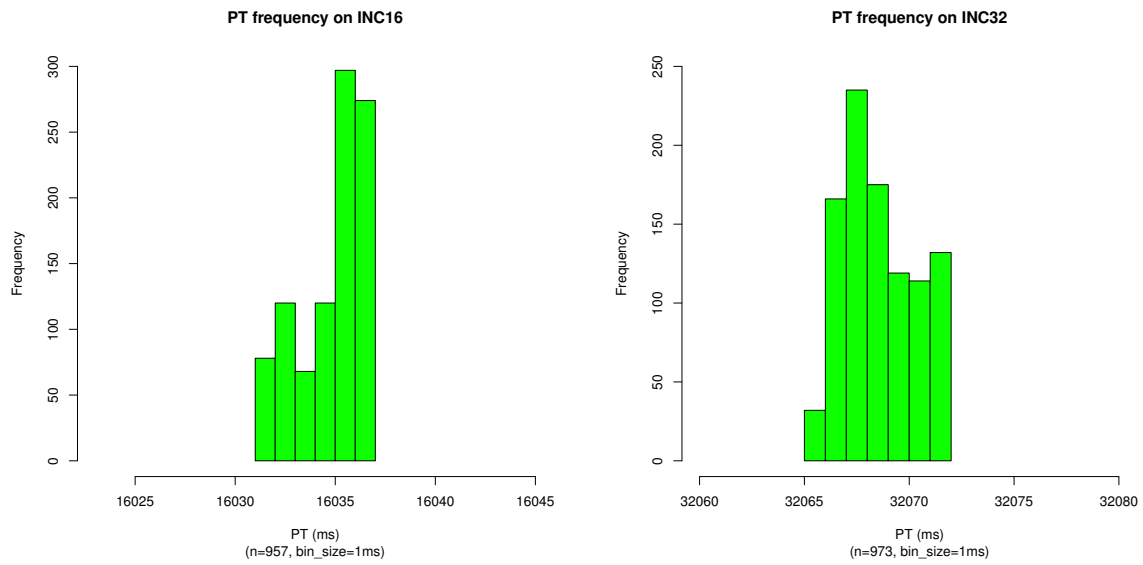
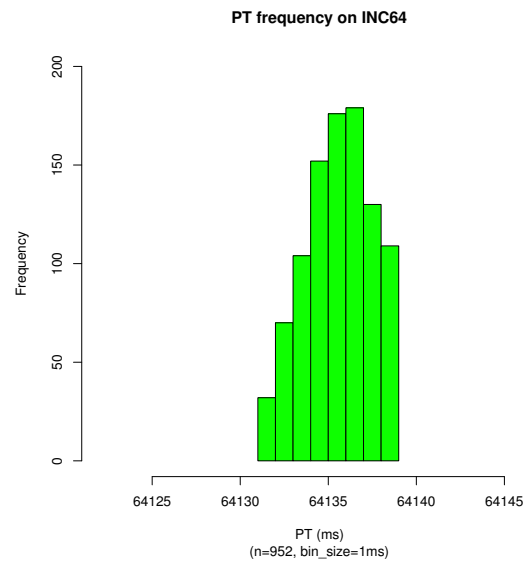


Figure 6: PT Histograms of INC1 ... INC8



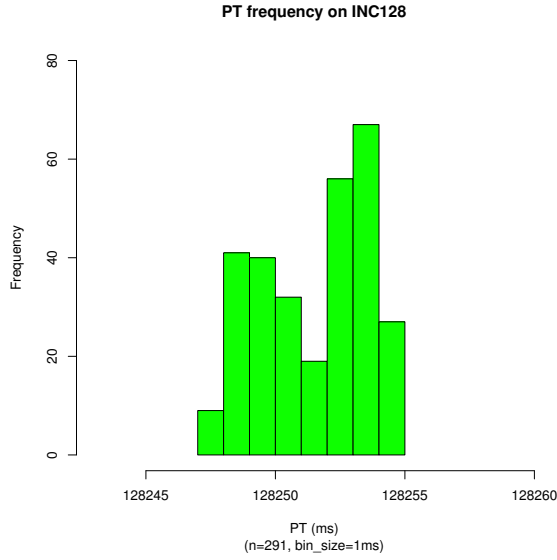
(a) PT frequency on INC16

(b) PT frequency on INC32

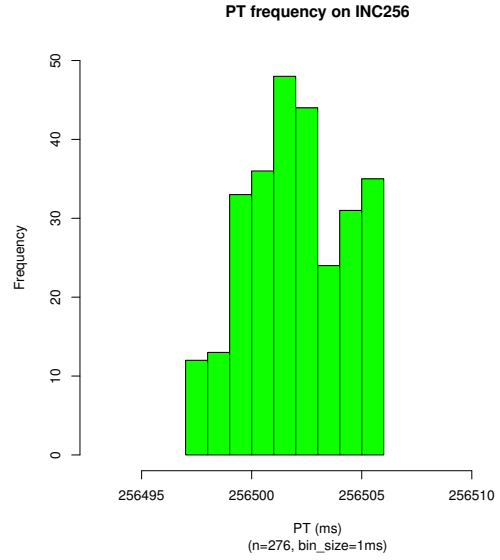


(c) PT frequency on INC64

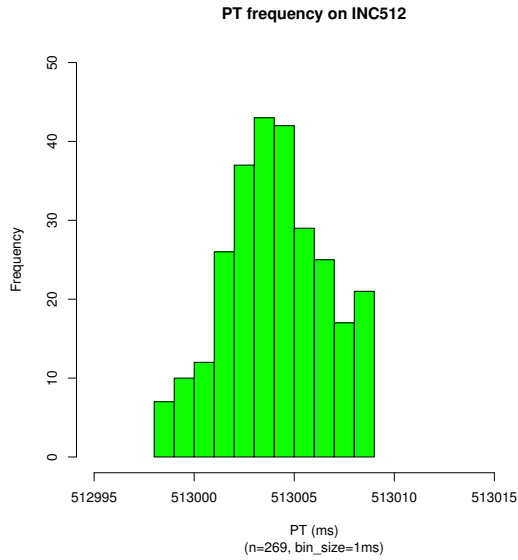
Figure 7: PT Histograms of INC16 ... INC64



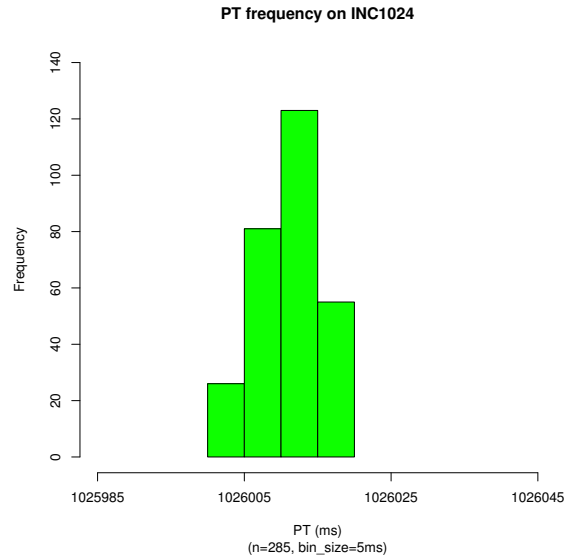
(a) PT frequency on INC128



(b) PT frequency on INC256



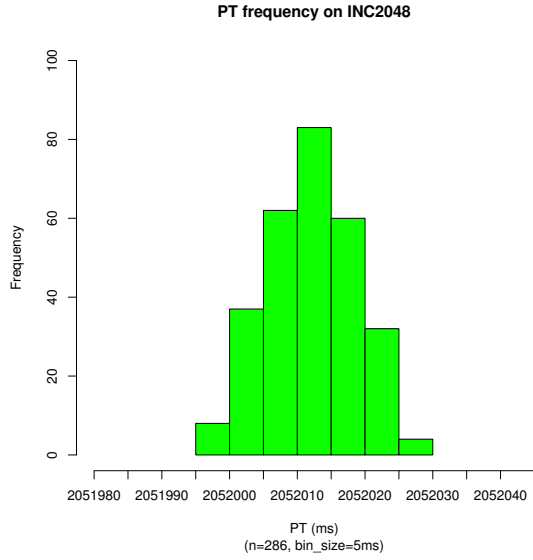
(c) PT frequency on INC512



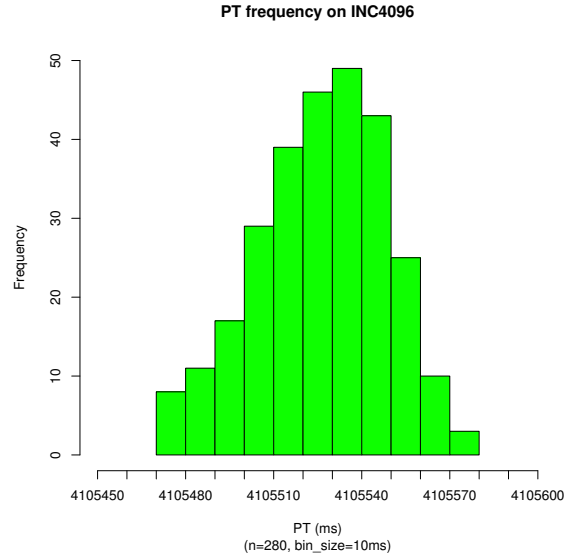
(d) PT frequency on INC1024

Figure 8: PT Histograms of INC128 ... INC1024

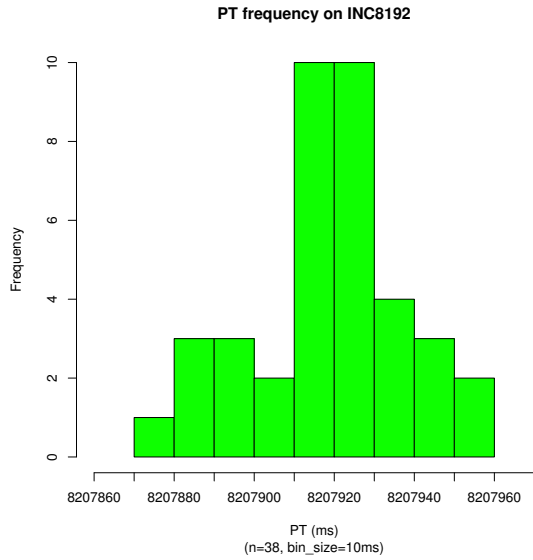




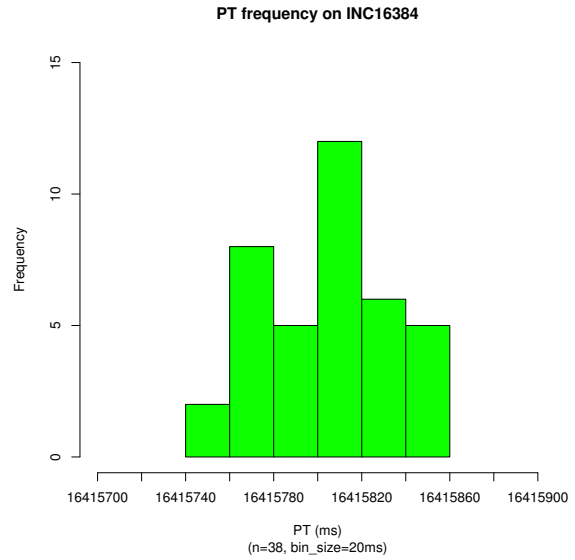
(a) PT frequency on INC2048



(b) PT frequency on INC4096



(c) PT frequency on INC8192



(d) PT frequency on INC16384

Figure 9: PT Histograms of INC2048 ... INC16384