QuantTree: Histograms for Change Detection in Multivariate Data Streams (Supplementary Materials)

This document provides additional results that were omitted from the main document due to space restrictions. In particular, we report in Tables 1 - 4 the average FPR and test power values that are otherwise represented as dots in Figures 2 (in the main document) and Figure 1 (in the Appendix). Figure 1 (in the Appendix) portrays the detection performance in the *large* TR configuration.

Table 2: Average values of FPR computed on the Gaussian Dataset.

N	K	d	Pearson's Distr. Free	Pearson Asym.	TV Distr. Free	TV Bootstrap	Voronoi	Density Tree	Parametric
4096	32	2	0.04	0.06	0.04	0.04	0.06	0.06	0.07
4096	32	8	0.04	0.06	0.04	0.04	0.06	0.06	0.07
4096	32	32	0.04	0.06	0.04	0.04	0.05	0.06	0.06
4096	32	64	0.04	0.06	0.04	0.04	0.06	0.06	0.06
4096	128	2	0.05	0.07	0.04	0.05	0.07	0.06	0.07
4096	128	8	0.05	0.07	0.04	0.04	0.07	0.06	0.06
4096	128	32	0.05	0.07	0.04	0.05	0.06	0.06	0.05
4096	128	64	0.05	0.07	0.04	0.05	0.05	0.06	0.06
16384	32	2	0.05	0.06	0.04	0.04	0.05	0.06	0.07
16384	32	8	0.05	0.06	0.04	0.04	0.06	0.06	0.07
16384	32	32	0.05	0.06	0.04	0.05	0.05	0.05	0.08
16384	32	64	0.05	0.06	0.04	0.05	0.05	0.06	0.07
16384	128	2	0.05	0.07	0.04	0.05	0.07	0.06	0.07
16384	128	8	0.05	0.07	0.04	0.05	0.06	0.06	0.06
16384	128	32	0.05	0.07	0.04	0.05	0.06	0.06	0.07
16384	128	64	0.05	0.06	0.04	0.05	0.06	0.06	0.07

Table 3: Average values of test power computed on the Gaussian Dataset.

N	K	d	Pearson's Distr. Free	Pearson Asym.	TV Distr. Free	TV Bootstrap	Voronoi	Density Tree	Parametric
4096	32	2	0.93	0.94	0.85	0.83	0.94	0.79	0.73
4096	32	8	0.46	0.51	0.34	0.32	0.28	0.22	0.37
4096	32	32	0.14	0.17	0.11	0.10	0.08	0.10	0.15
4096	32	64	0.09	0.12	0.07	0.06	0.06	0.08	0.11
4096	128	2	0.81	0.84	0.66	0.67	0.83	0.76	0.72
4096	128	8	0.38	0.43	0.25	0.26	0.24	0.23	0.35
4096	128	32	0.14	0.18	0.09	0.10	0.08	0.10	0.15
4096	128	64	0.10	0.13	0.07	0.07	0.06	0.08	0.10
16384	32	2	1.00	1.00	1.00	1.00	1.00	0.95	1.00
16384	32	8	0.92	0.93	0.89	0.90	0.74	0.59	0.91
16384	32	32	0.49	0.52	0.36	0.37	0.16	0.20	0.48
16384	32	64	0.27	0.29	0.18	0.19	0.10	0.13	0.28
16384	128	2	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16384	128	8	0.95	0.96	0.84	0.85	0.75	0.69	0.92
16384	128	32	0.47	0.51	0.29	0.32	0.16	0.20	0.47
16384	128	64	0.24	0.28	0.13	0.16	0.09	0.12	0.28

Table 4: Average values of FPR computed on the real-world datasets.

N	K	Pearson's Distr. Free	Pearson Asym.	TV Distr. Free	TV Bootstrap	Voronoi	Density Tree
4096	32	0.04	0.06	0.05	0.04	0.06	0.06
4096	128	0.05	0.07	0.04	0.05	0.07	0.06
16384	32	0.05	0.06	0.04	0.05	0.06	0.06
16384	128	0.05	0.06	0.04	0.06	0.07	0.07

Table 5: Average values of test power computed on the real-world datasets.

N	K	Pearson's Distr. Free	Pearson Asym.	TV Distr. Free	TV Bootstrap	Voronoi	Density Tree
4096	32	0.46	0.49	0.38	0.38	0.06	0.18
4096	128	0.61	0.64	0.52	0.52	0.07	0.26
16384	32	0.80	0.81	0.73	0.73	0.07	0.31
16384	128	0.88	0.90	0.81	0.83	0.08	0.59

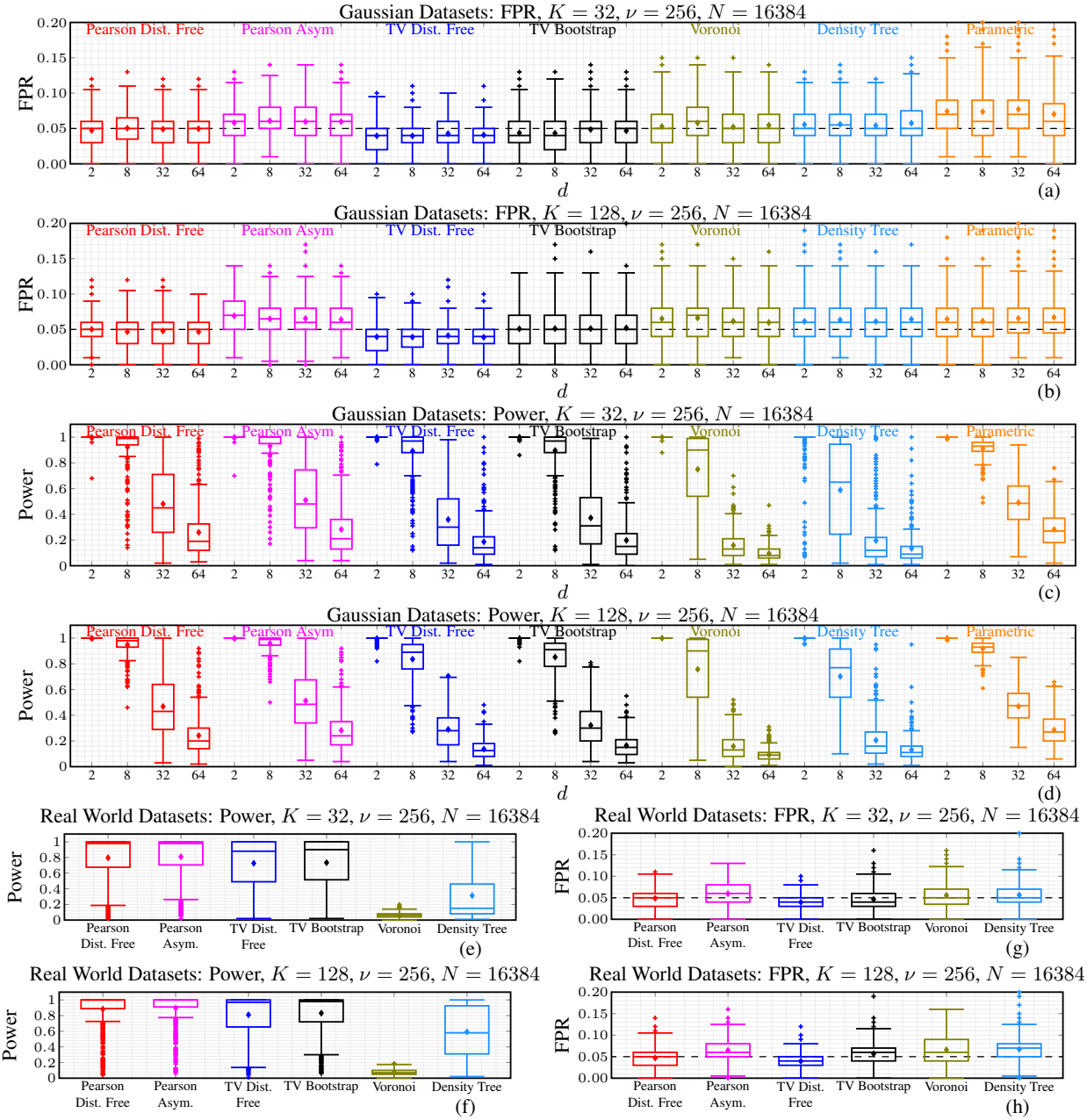

Figure 3: Results on synthetically generated and real world datasets using the *large* TR configuration. The larger values of N and ν guarantee higher power and a better control of the FPR than in *small* TR configuration. Qualitatively, we see the same trends as in in Figure 2.