
Xilinx: U30 HEVC/U50 HEVC

— Preliminary Benchmark Results —
Jan Ozer June 15, 2020

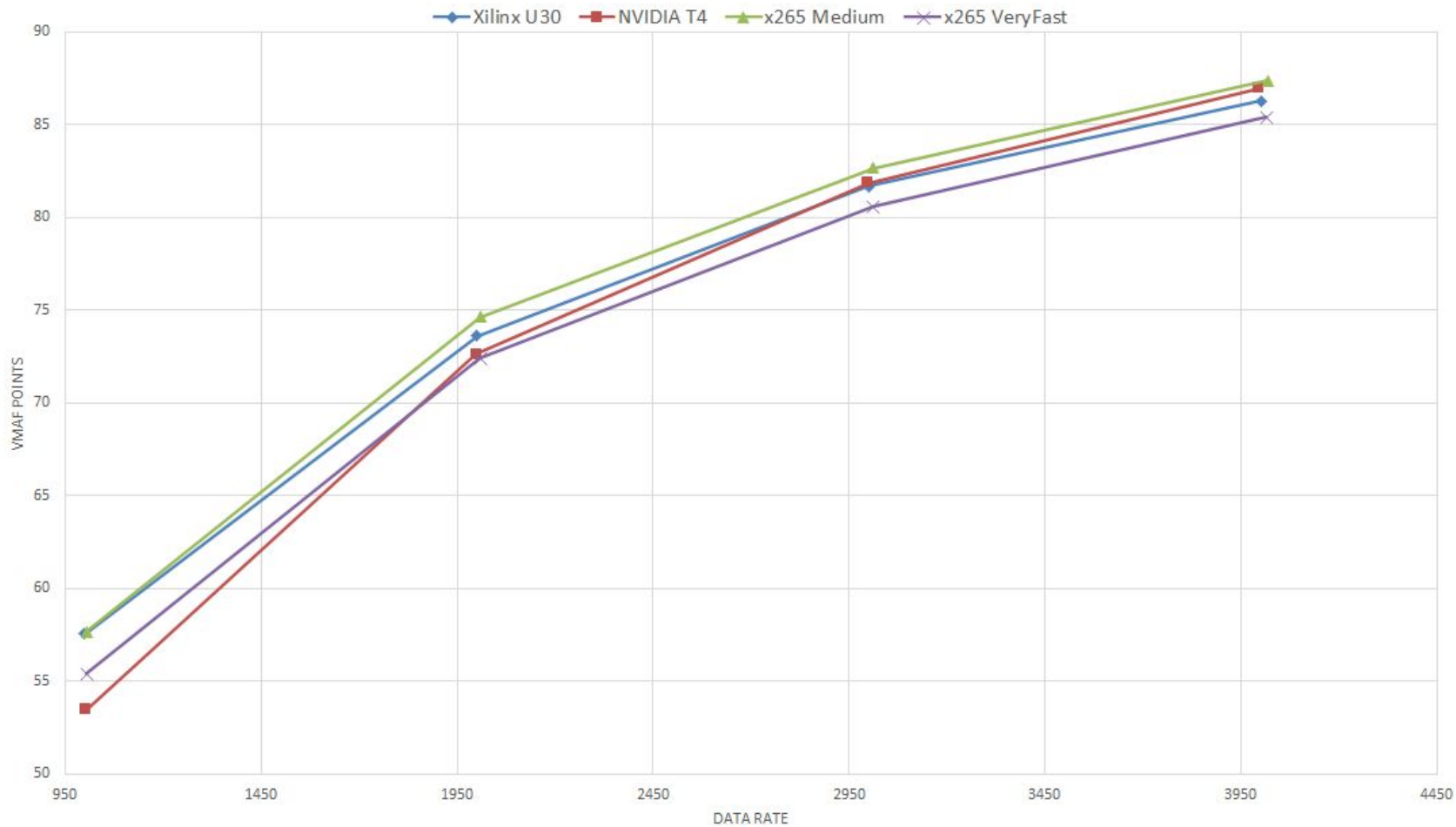
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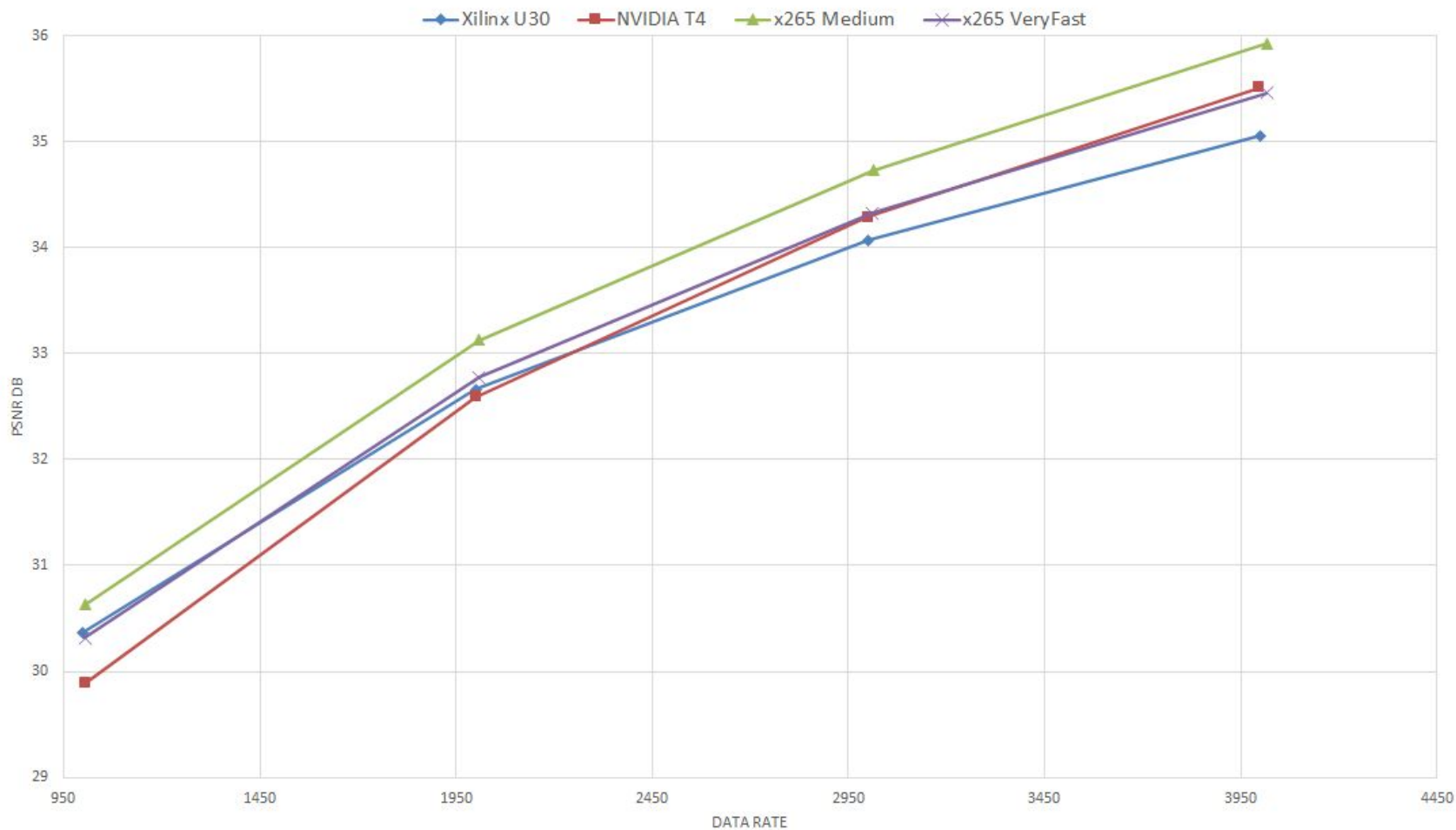
U30 HEVC

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U30 COMPS - FOOTBALL 1080P60 - VMAF



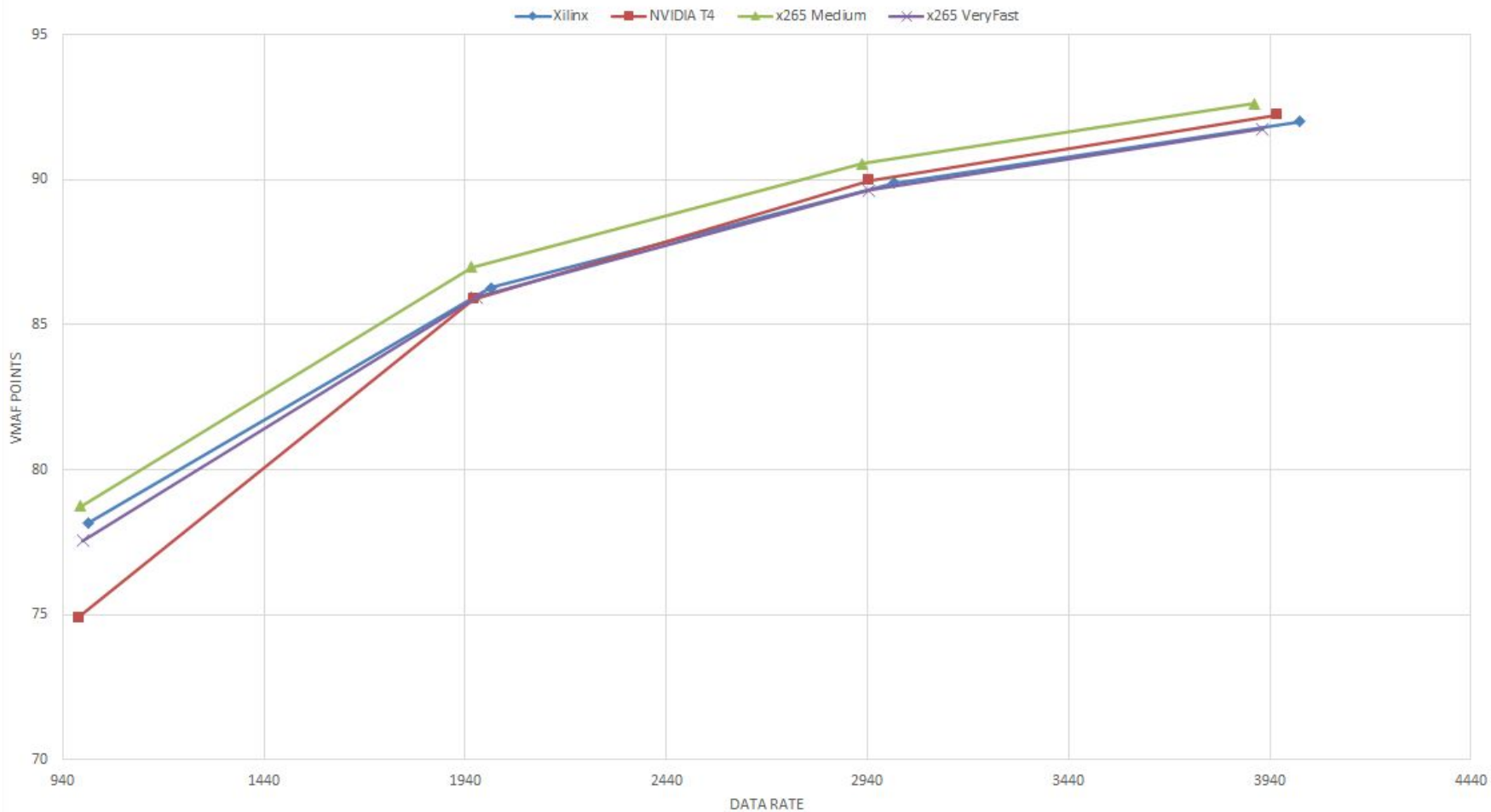
U30 COMPS - FOOTBALL 1080P60 - PSNR



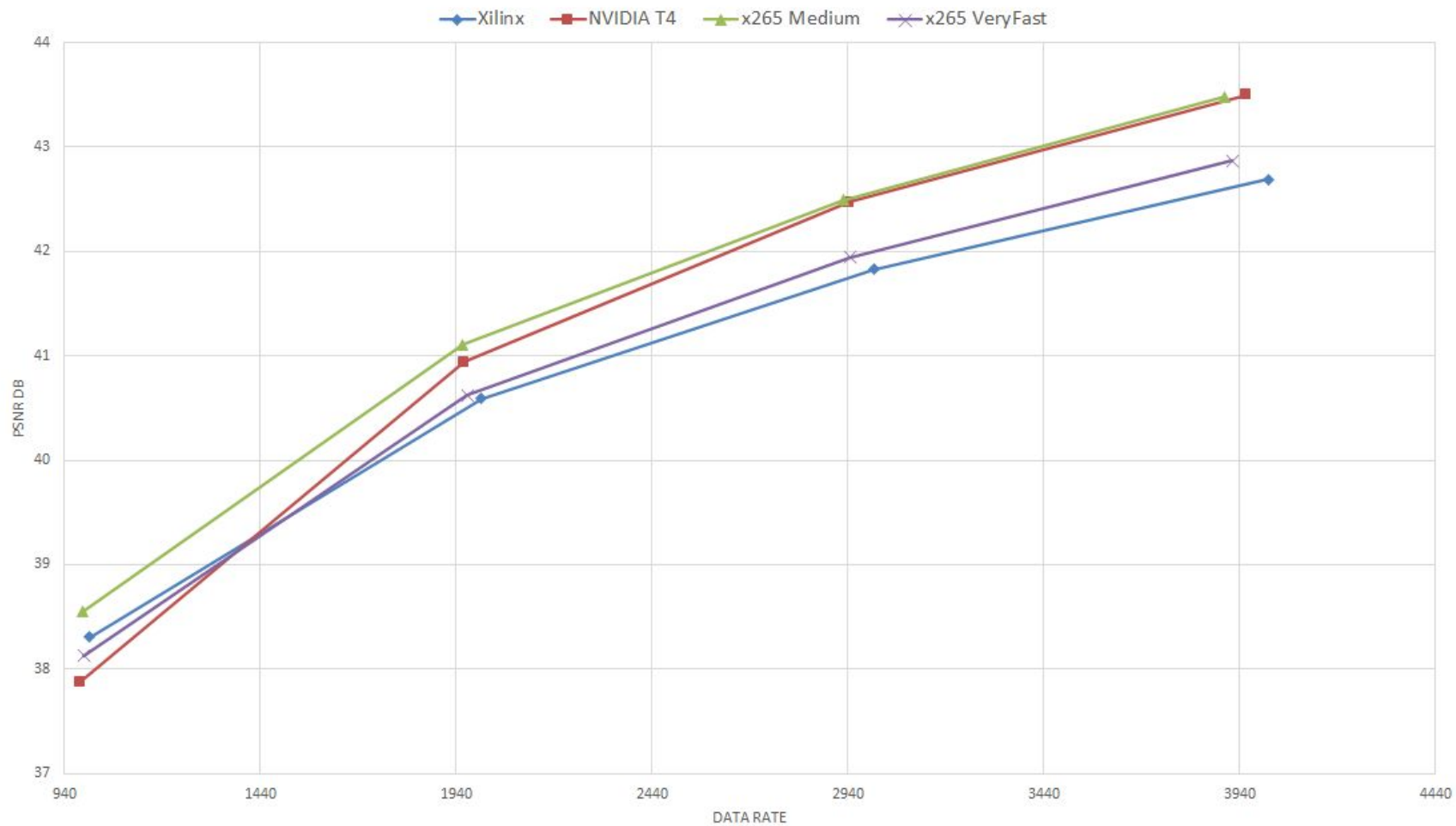
U30 Football BD-Rate Computations

VMAF	Xilinx U30	NVIDIA T4	x265 Medium	x265 VeryFast
Xilinx U30	X	-4.98	3.90	-6.21
NVIDIA T4	5.24	X	9.12	-0.44
x265 Medium	-3.75	-8.36	X	-9.65
x265 VeryFast	6.62	0.44	10.68	X
PSNR	Xilinx U30	NVIDIA T4	x265 Medium	x265 VeryFast
Xilinx U30	X	-1.34	13.87	3.30
NVIDIA T4	1.36	X	14.22	4.30
x265 Medium	-12.18	-12.45	X	-9.12
x265 VeryFast	-3.20	-4.12	10.04	X

U30 COMPS - GTAV 1080P60 - VMAF



U30 COMPS - GTAV 1080P60 - PSNR

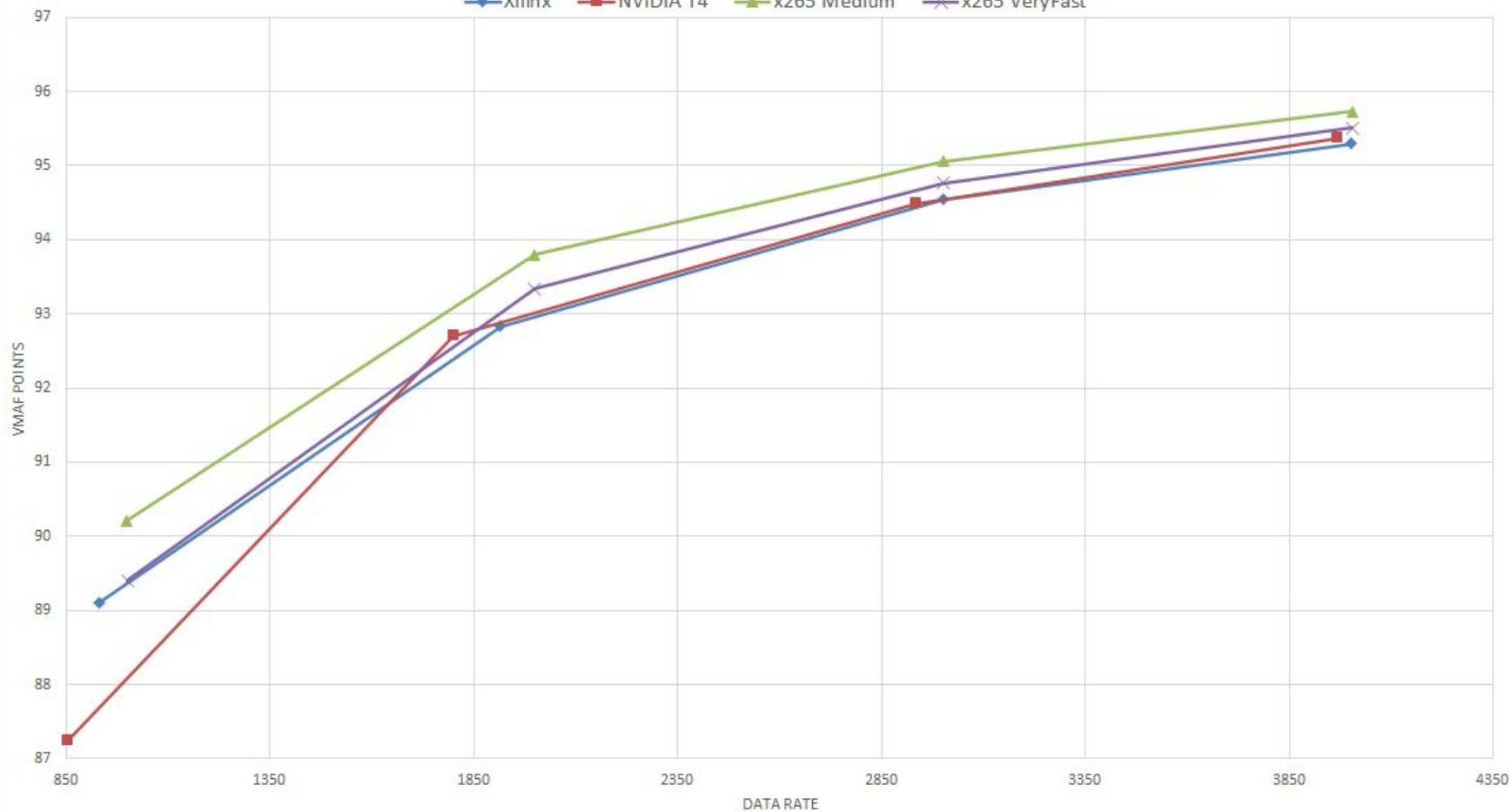


U30 GTAV BD-Rate Computations

VMAF	Xilinx	NVIDIA T4	x265 Medium	x265 VeryFast
Xilinx	X	-3.89	9.65	-1.70
NVIDIA T4	4.05	X	13.38	2.98
x265 Medium	-8.80	-11.80	X	-10.25
x265 VeryFast	1.73	-2.89	11.42	X
PSNR	Xilinx	NVIDIA T4	x265 Medium	x265 VeryFast
Xilinx	X	10.41	18.89	2.47
NVIDIA T4	-9.43	X	5.73	-7.14
x265 Medium	-15.89	-5.42	X	-13.68
x265 VeryFast	-2.41	7.69	15.85	X

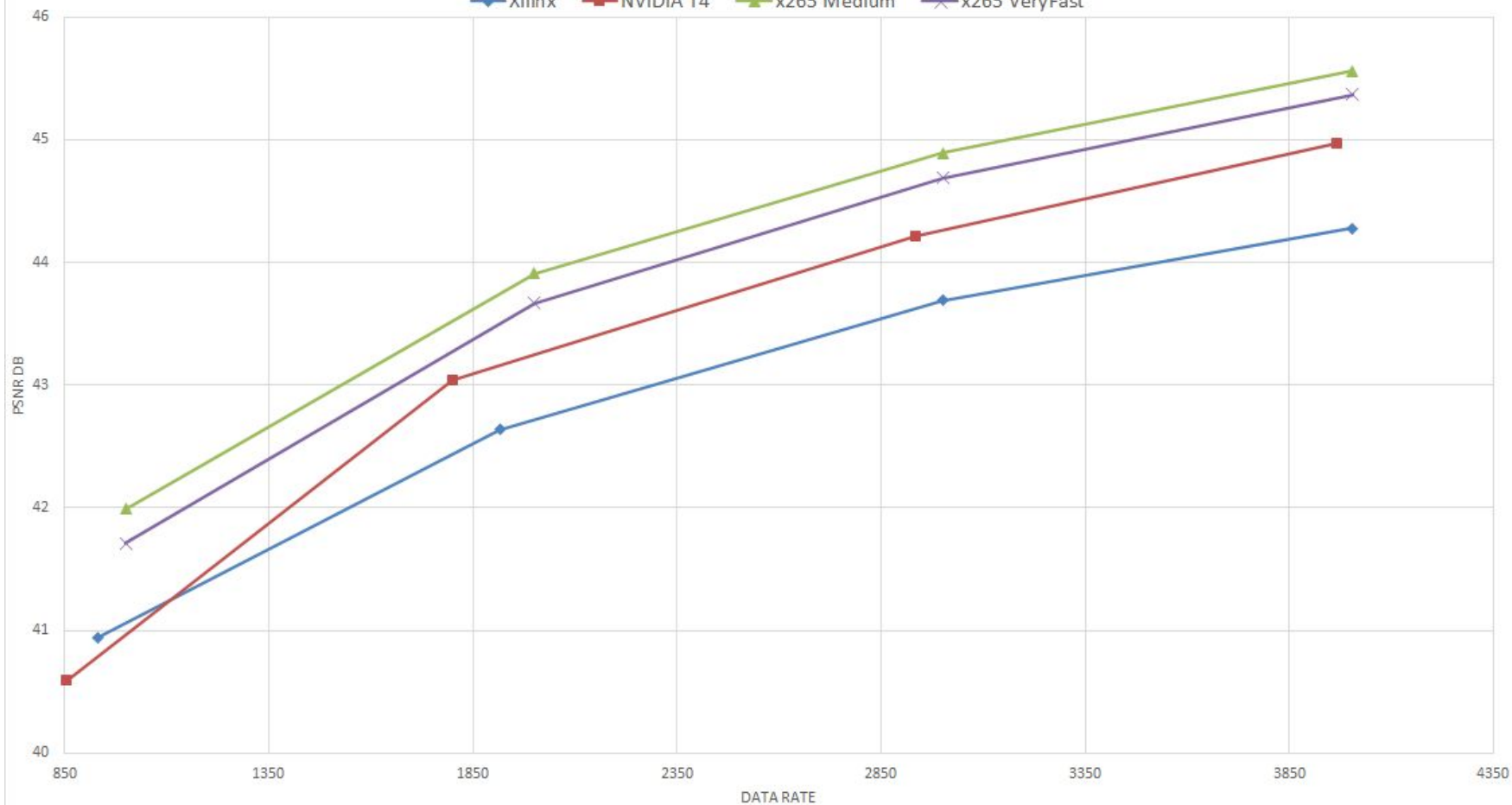
U30 COMPS - MERIDIAN 1080P60 - VMAF

Xilinx NVIDIA T4 x265 Medium x265 VeryFast



U30 COMPS - MERIDIAN 1080P60 - PSNR

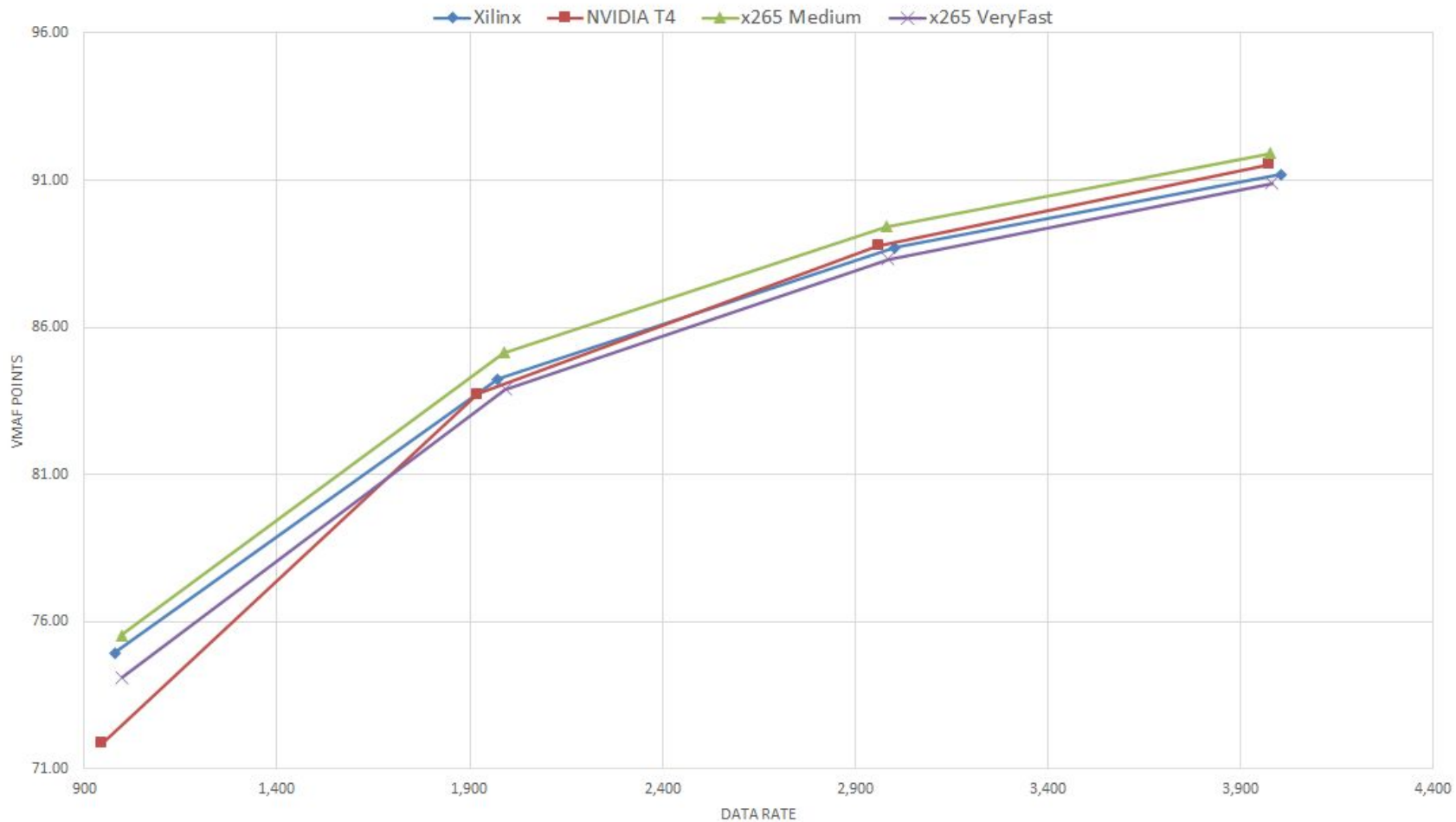
Xilinx NVIDIA T4 x265 Medium x265 VeryFast



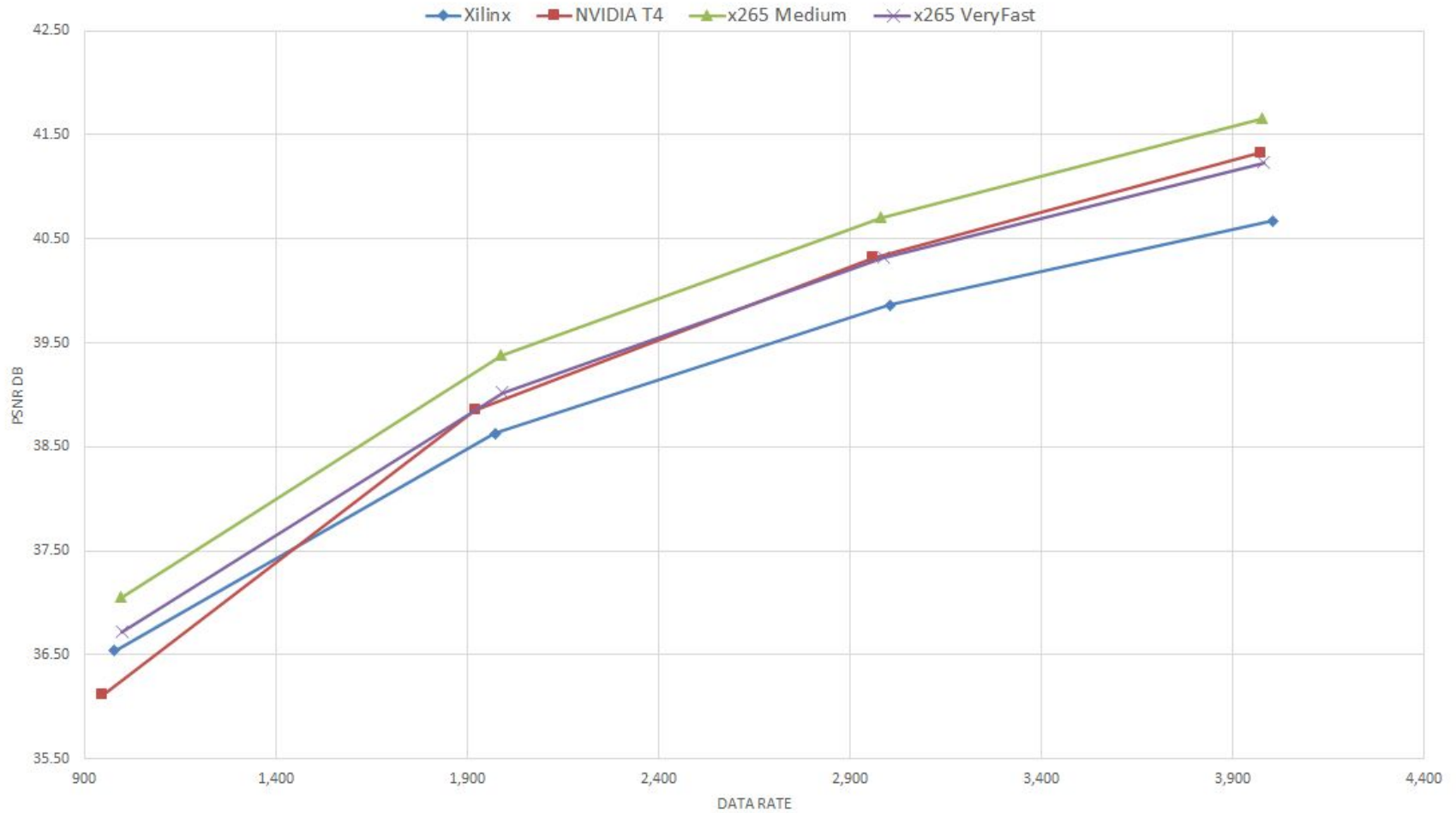
U30 Meridian BD-Rate Computations

VMAF	Xilinx	NVIDIA T4	x265 Medium	x265 VeryFast
Xilinx	X	2.68	19.96	6.22
NVIDIA T4	-2.61	X	15.90	3.05
x265 Medium	-16.64	-13.72	X	-10.85
x265 VeryFast	-5.85	-2.96	12.17	X
PSNR	Xilinx	NVIDIA T4	x265 Medium	x265 VeryFast
Xilinx	X	21.94	58.84	42.92
NVIDIA T4	-17.99	X	26.79	14.99
x265 Medium	-37.04	-21.13	X	-8.84
x265 VeryFast	-30.03	-13.03	9.70	X

U30 COMPS - OVERALL 1080P60 - VMAF



U30 COMPS - OVERALL 1080P60 - PSNR



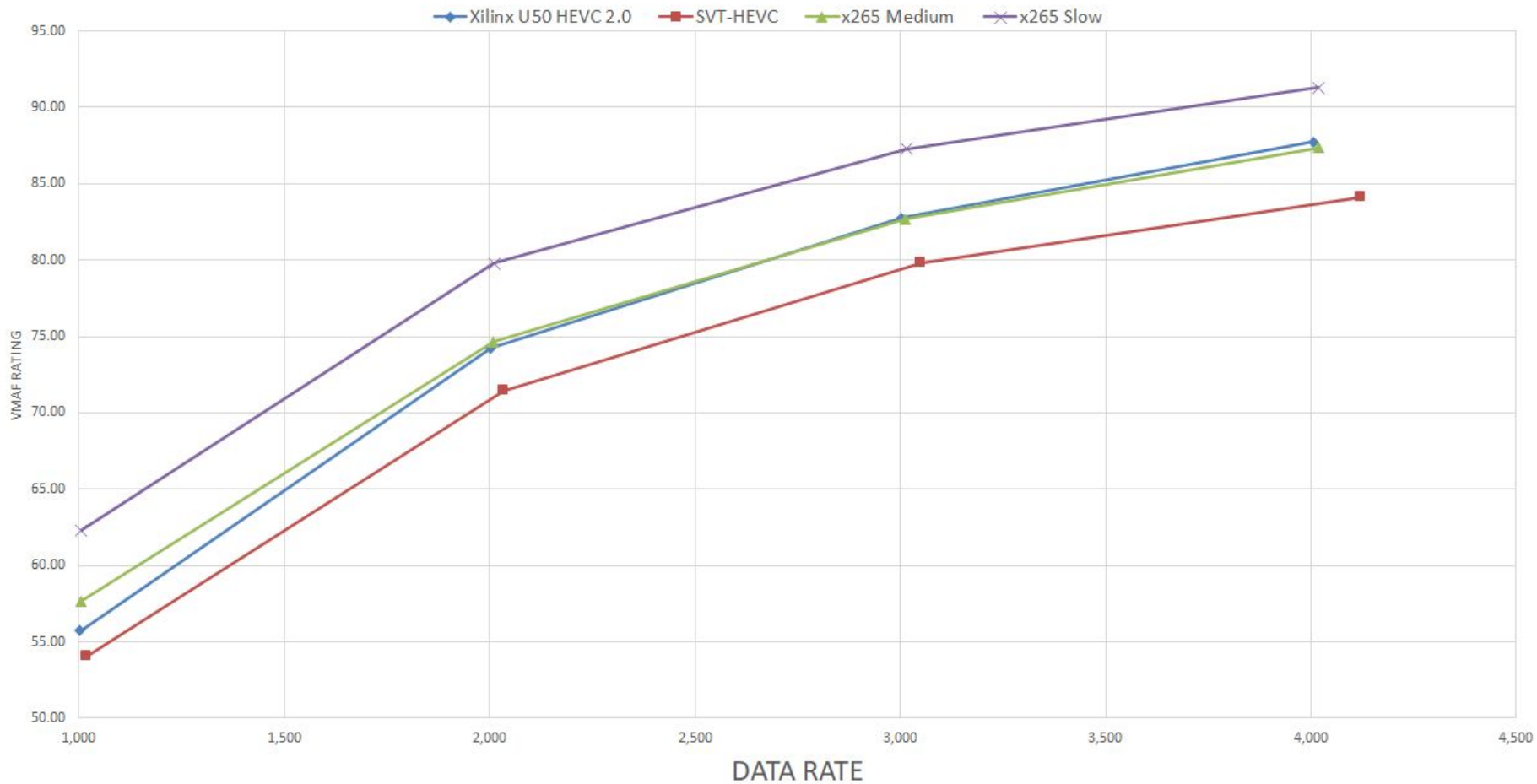
U30 Overall BD-Rate Computations

VMAF	Xilinx	NVIDIA T4	x265 Medium	x265 VeryFast
Xilinx	X	-2.68	6.47	-4.32
NVIDIA T4	2.76	X	8.91	-1.18
x265 Medium	-6.08	-8.18	X	-9.98
x265 VeryFast	4.52	1.19	11.08	X
PSNR	Xilinx	NVIDIA T4	x265 Medium	x265 VeryFast
Xilinx	X	8.74	25.84	11.93
NVIDIA T4	-8.04	X	13.32	1.74
x265 Medium	-20.53	-11.76	X	-10.69
x265 VeryFast	-10.66	-1.71	11.97	X

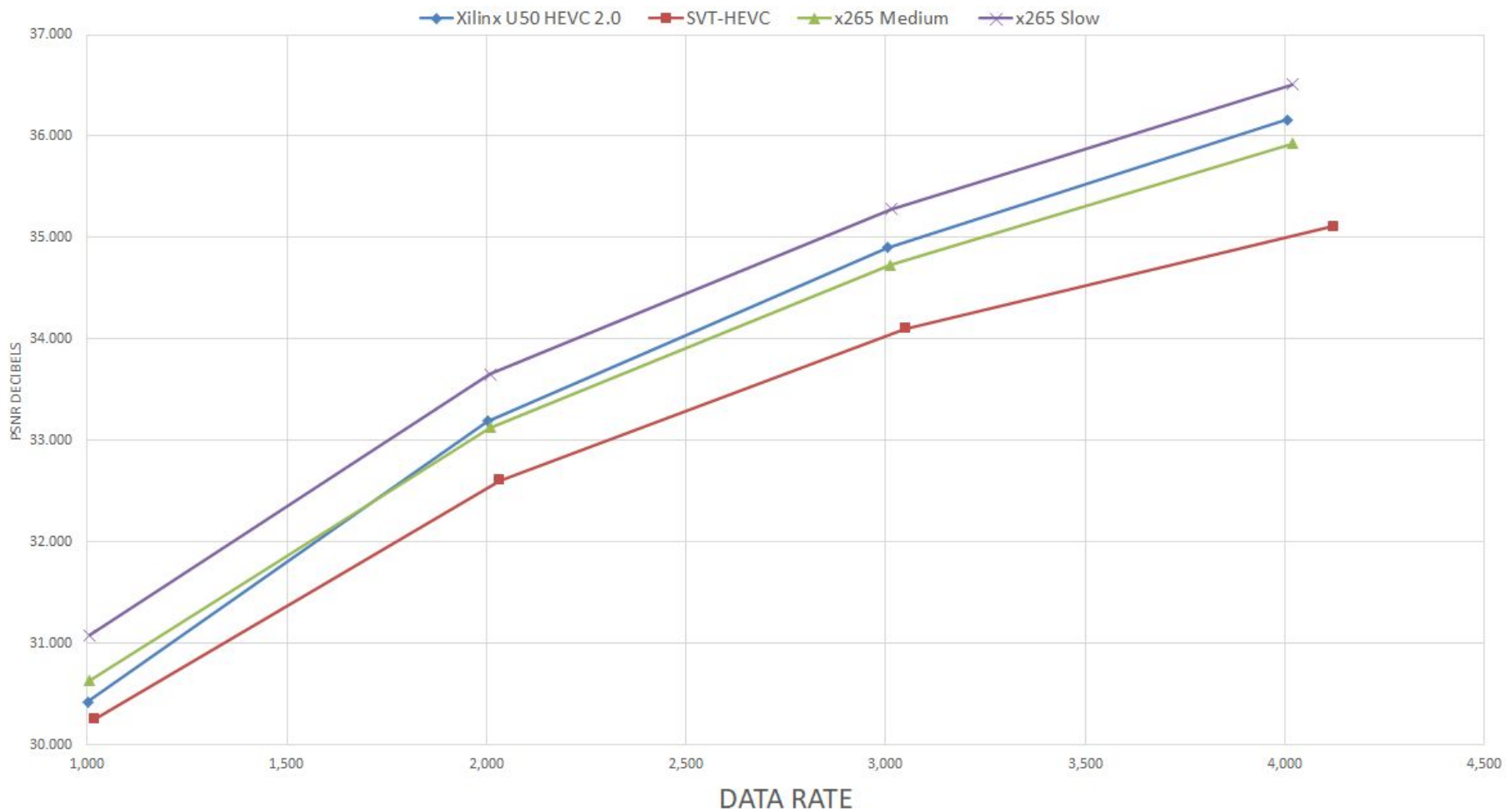
U50 HEVC 2.0

- **Codecs:** U50 HEVC 2.0, x265 Medium, x265 Slow, Intel SVT-HEVC, Xilinx HEVC 1.0
- **Clips:** Football, GTAV, Meridian, Overall
- **Metrics:** VMAF, PSNR
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U50 COMPS - FOOTBALL 1080P60 - VMAF



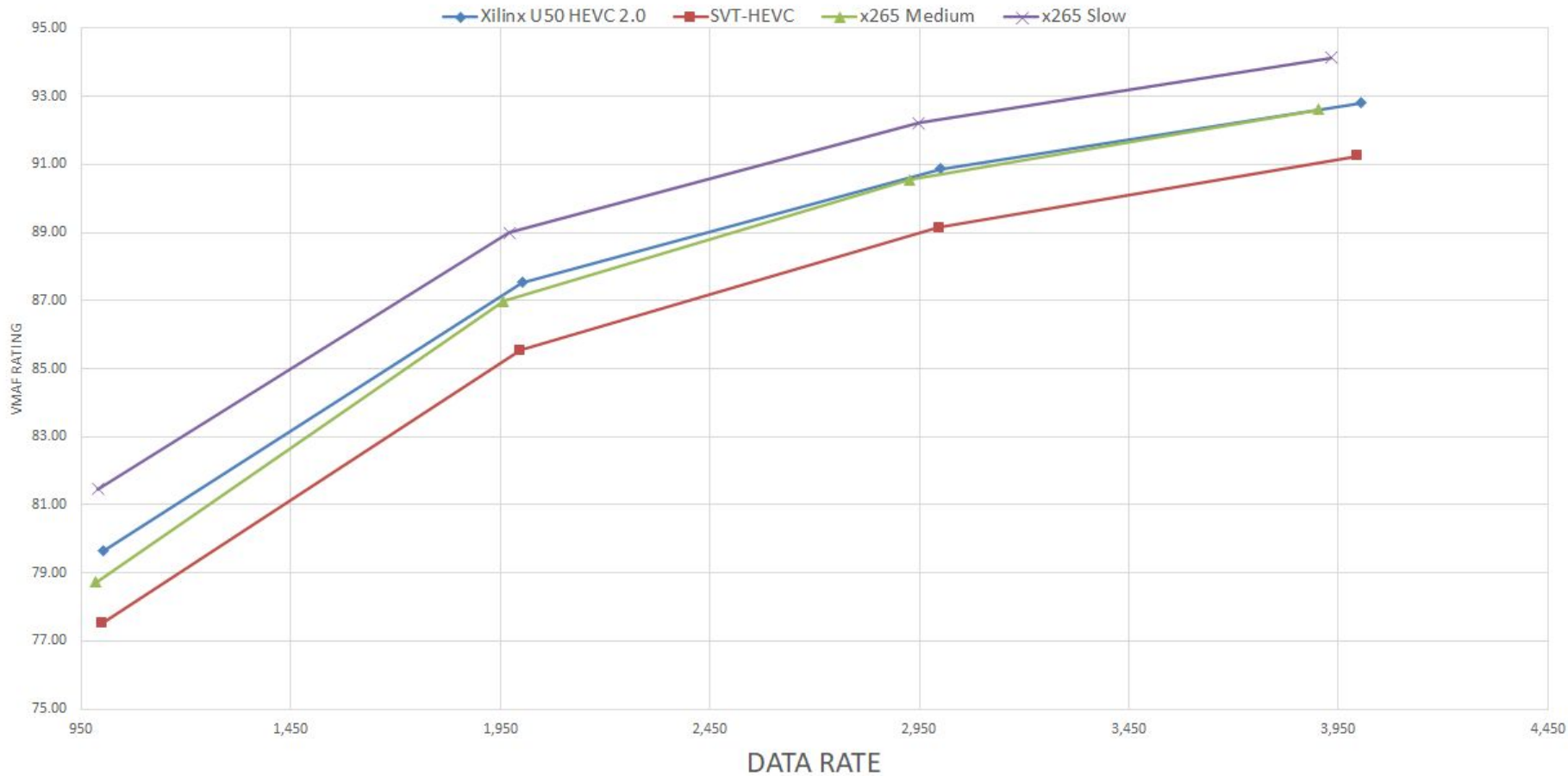
U50 COMPS - FOOTBALL 1080P60 - PSNR



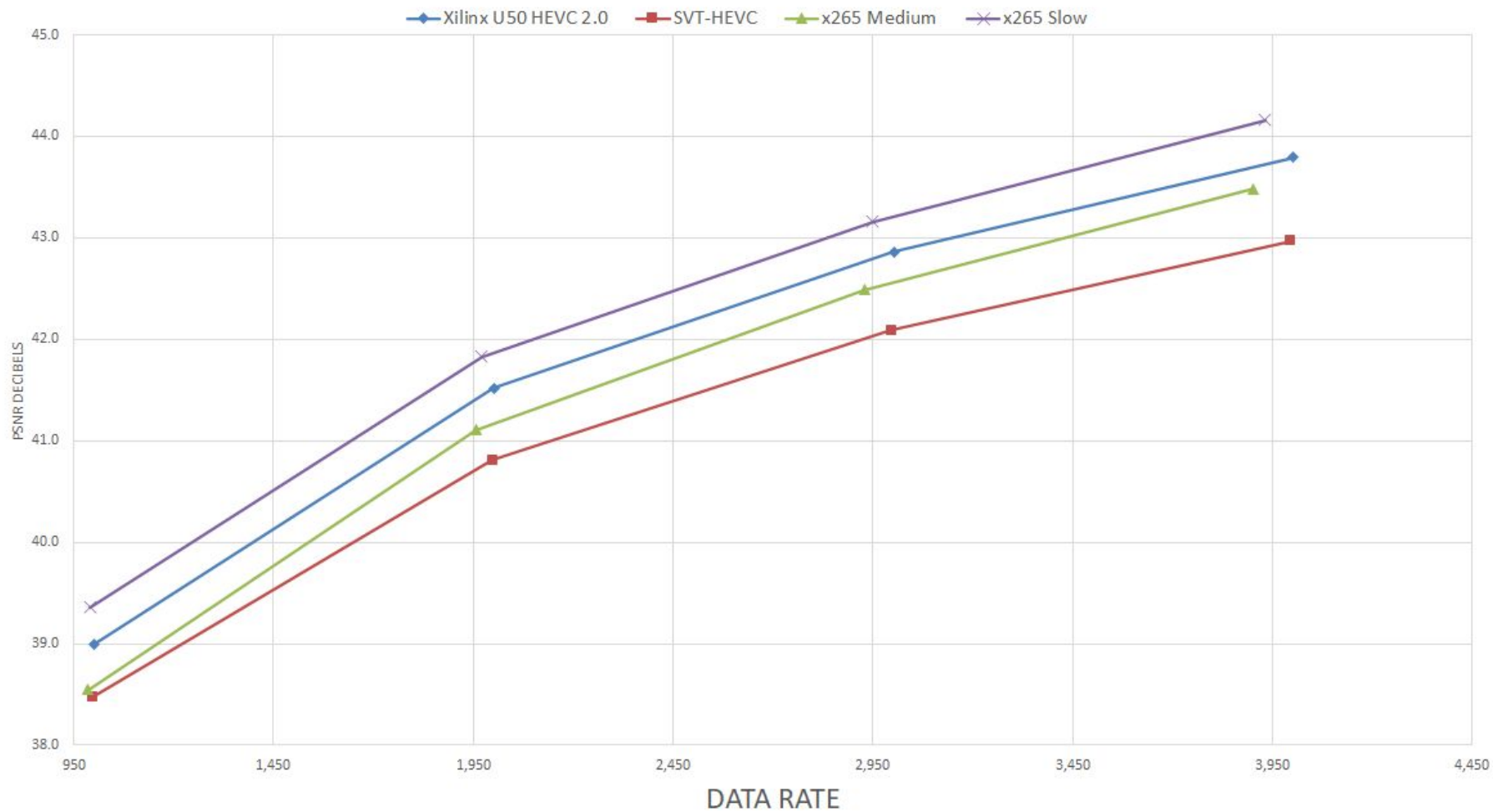
U50 Football BD-Rate Computations

VMAF Football	Xilinx U50 HEVC 2.0	SVT-HEVC	x265 Medium	x265 Slow
Xilinx U50 HEVC 2.0	X	-13.39	2.08	26.53
SVT-HEVC	15.46	X	18.72	46.32
x265 Medium	-2.04	-15.77	X	24.80
x265 Slow	-20.96	-31.66	-19.87	X
PSNR Football	Xilinx U50 HEVC 2.0	SVT-HEVC	x265 Medium	x265 Slow
Xilinx U50 HEVC 2.0	X	-15.05	-1.41	11.87
SVT-HEVC	17.71	X	17.30	34.31
x265 Medium	1.44	-14.75	X	14.27
x265 Slow	-10.61	-25.55	-12.49	X

U50 COMPS - GTAV 1080P60 - VMAF



U50 COMPS - GTAV 1080P60 - PSNR

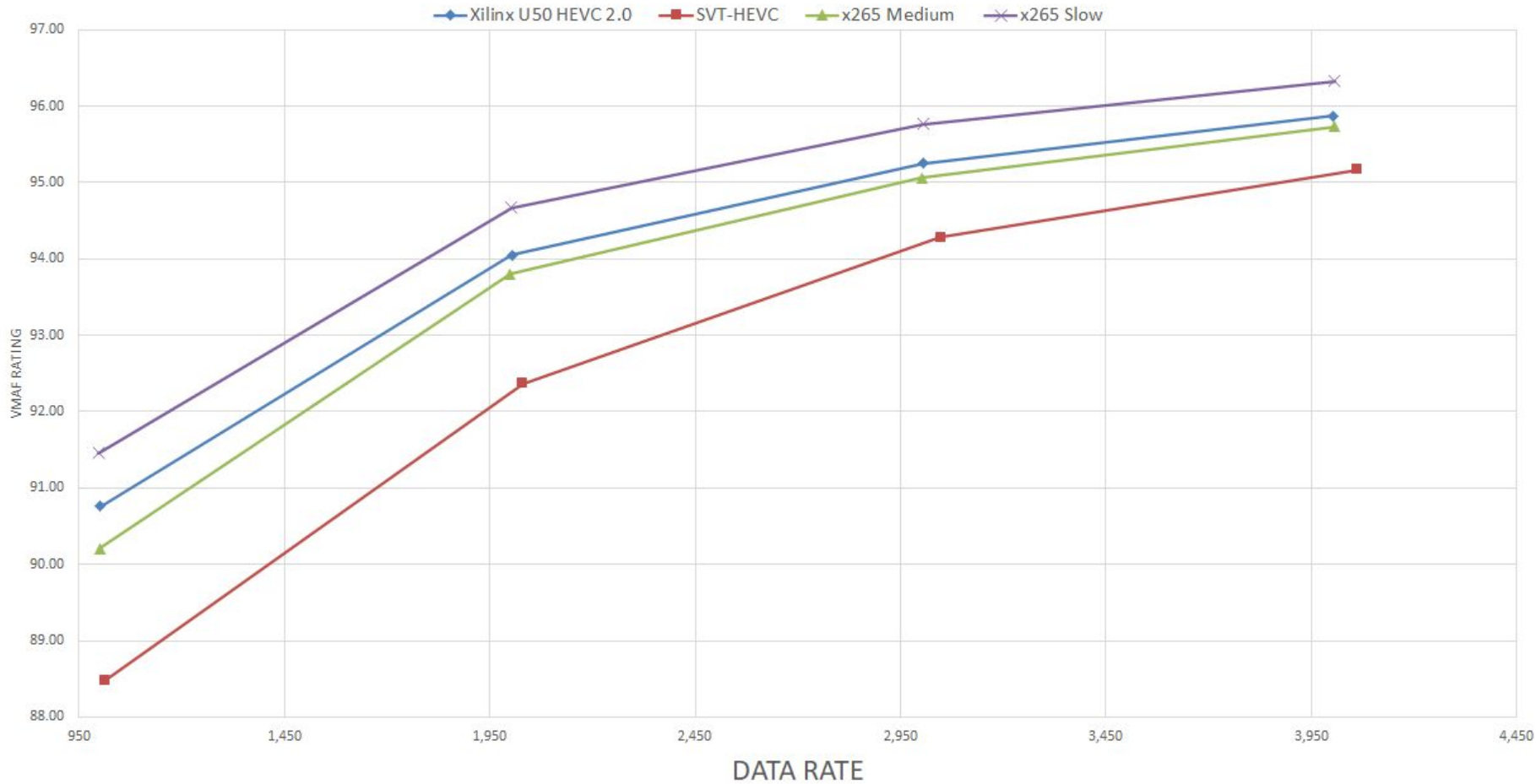


U50 GTAV BD-Rate Computations

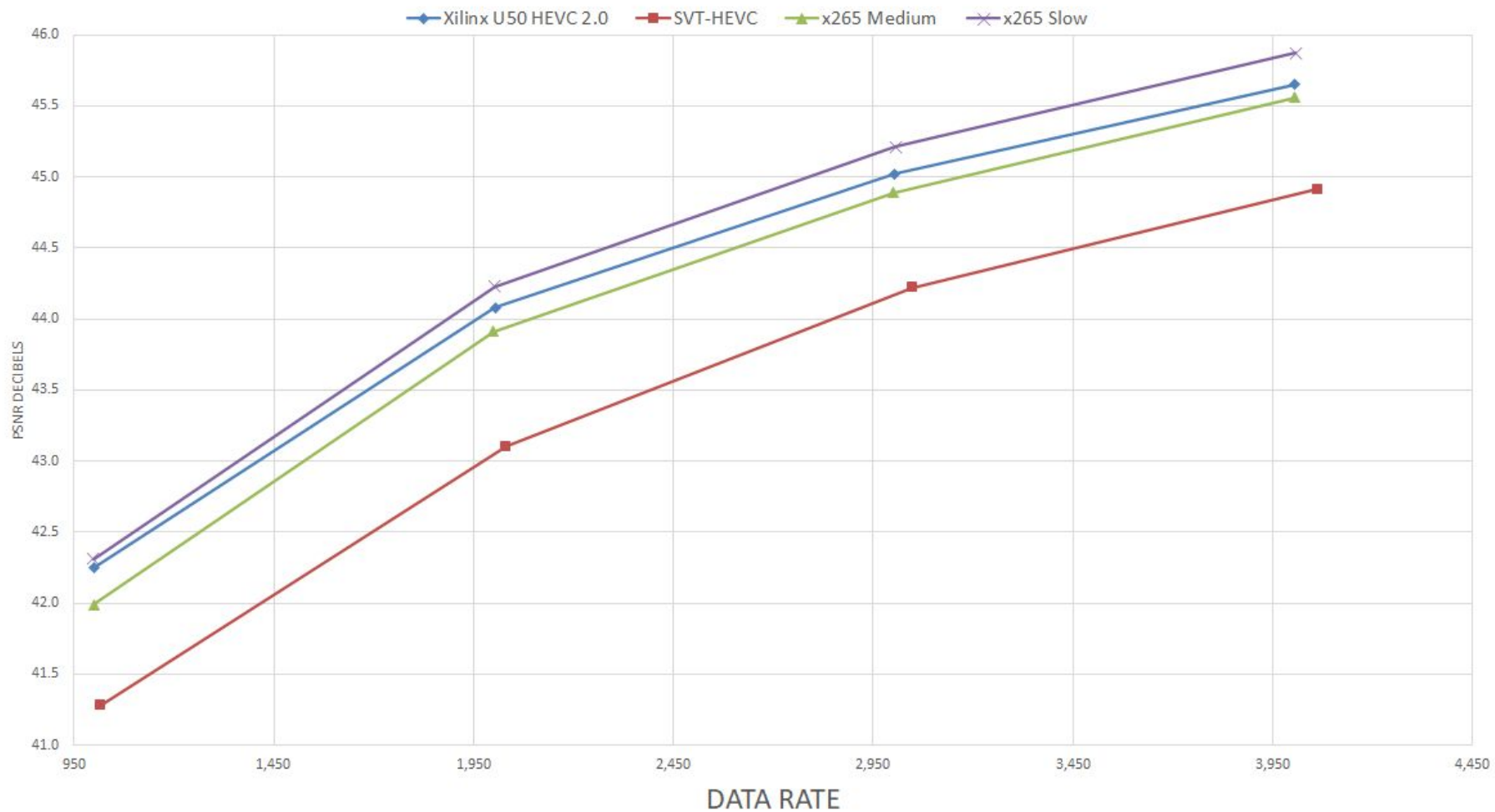
VMAF GTAV	Xilinx U50 HEVC 2.0	SVT-HEVC	x265 Medium	x265 Slow
Xilinx U50 HEVC 2.0	X	-18.00	-3.37	19.10
SVT-HEVC	21.95	X	17.11	45.16
x265 Medium	3.49	-14.61	X	22.88
x265 Slow	-16.04	-31.11	-18.62	X

PSNR GTAV	Xilinx U50 HEVC 2.0	SVT-HEVC	x265 Medium	x265 Slow
Xilinx U50 HEVC 2.0	X	-18.58	-8.80	11.64
SVT-HEVC	22.82	X	11.02	37.71
x265 Medium	9.65	-9.93	X	22.32
x265 Slow	-10.42	-27.38	-18.24	X

U50 COMPS - MERIDIAN 1080P60 - VMAF



U50 COMPS - MERIDIAN 1080P60 - PSNR

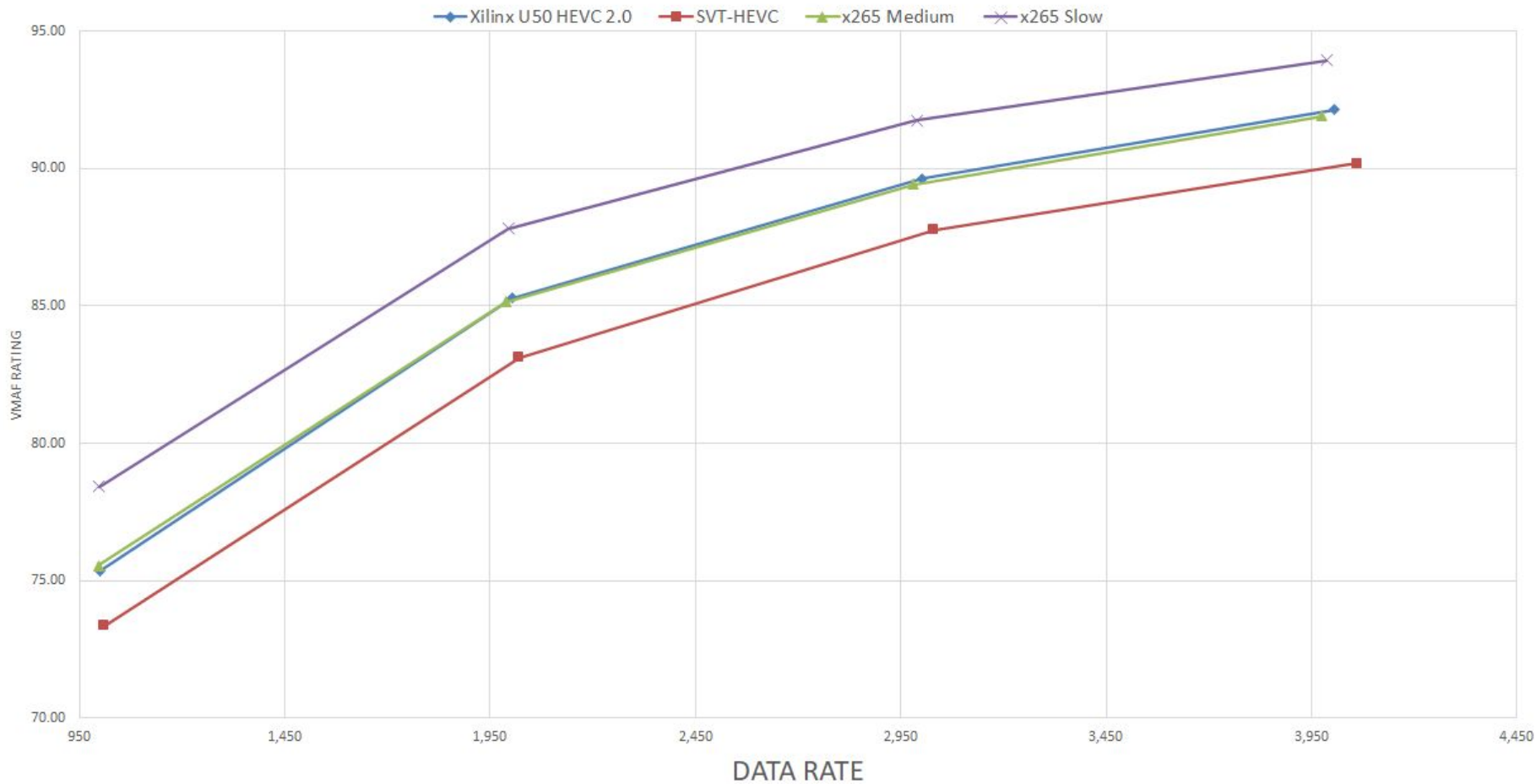


U50 Meridian BD-Rate Computations

VMAF Meridian	Xilinx U50 HEVC 2.0	SVT-HEVC	x265 Medium	x265 Slow
Xilinx U50 HEVC 2.0	X	-31.57	-6.36	18.71
SVT-HEVC	46.12	X	37.83	69.97
x265 Medium	6.79	-27.45	X	26.21
x265 Slow	-15.76	-41.17	-20.76	X

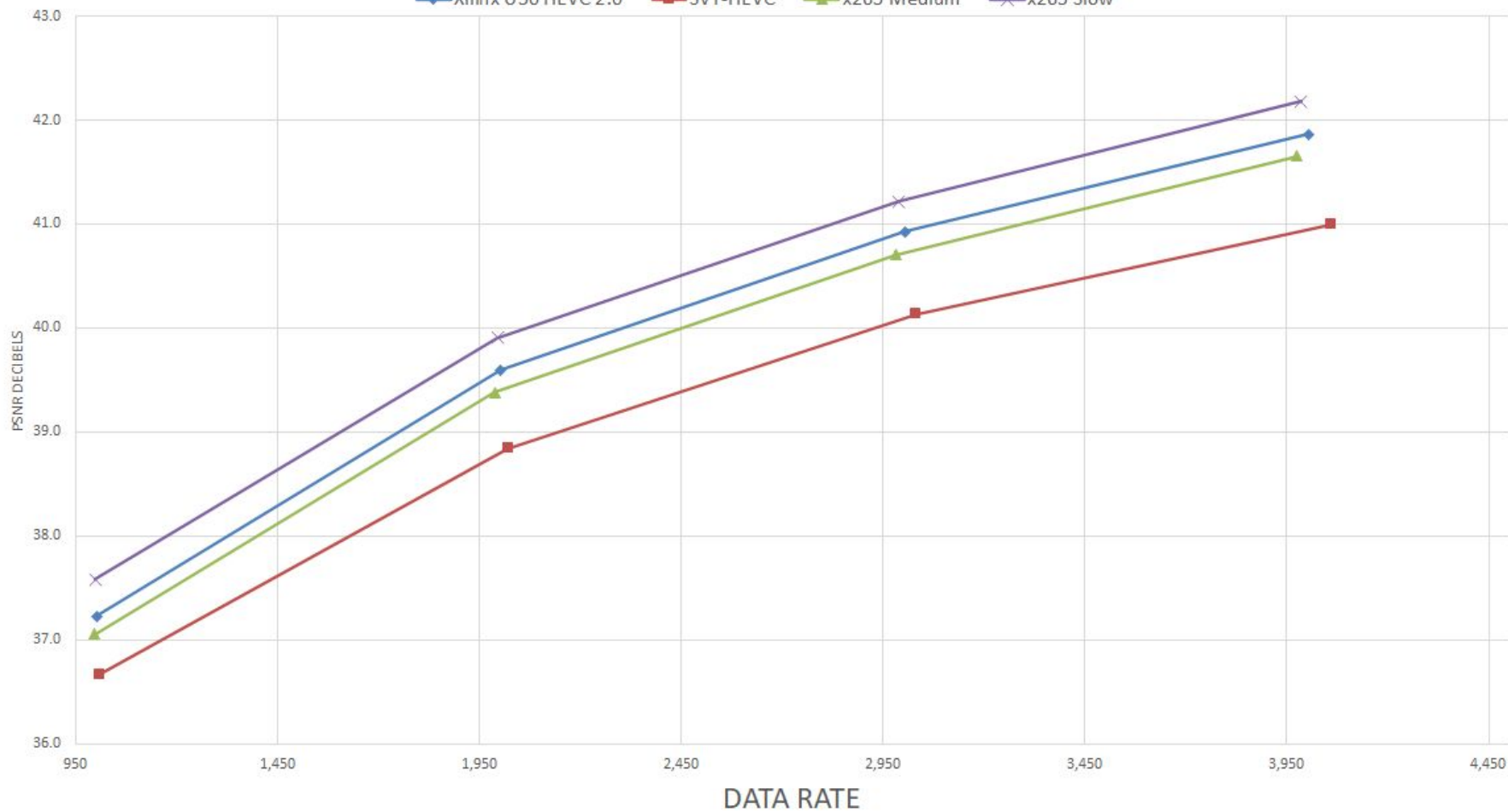
PSNR Meridian	Xilinx U50 HEVC 2.0	SVT-HEVC	x265 Medium	x265 Slow
Xilinx U50 HEVC 2.0	X	-31.77	-6.37	6.09
SVT-HEVC	46.56	X	36.72	54.18
x265 Medium	6.81	-26.86	X	13.17
x265 Slow	-5.74	-35.14	-11.64	X

U50 COMPS - OVERALL 1080P60 - VMAF



U50 COMPS - OVERALL 1080P60 - PSNR

—◆— Xilinx U50 HEVC 2.0 —■— SVT-HEVC —▲— x265 Medium —×— x265 Slow



U50 Overall BD-Rate Computations

VMAF Overall	Xilinx U50 HEVC 2.0	SVT-HEVC	x265 Medium	x265 Slow
Xilinx U50 HEVC 2.0	X	-17.01	-0.08	24.04
SVT-HEVC	20.49	X	20.66	48.99
x265 Medium	0.08	-17.12	X	24.46
x265 Slow	-19.38	-32.88	-19.65	X

PSNR Overall	Xilinx U50 HEVC 2.0	SVT-HEVC	x265 Medium	x265 Slow
Xilinx U50 HEVC 2.0	X	-21.16	-5.33	10.42
SVT-HEVC	26.83	X	19.99	40.72
x265 Medium	5.63	-16.66	X	16.77
x265 Slow	-9.44	-28.94	-14.36	X