

Revisiting the Performance of Deep Learning-Based Vulnerability Detection on Realistic Datasets: Appendix

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A.1 Description of the *Real-Vul* projects.

Table 1: List of the projects included in *Real-Vul* along with the description.

Project	Description
Chromium	Open source browser
FFmpeg	Video and audio processing
ImageMagic	Image manipulation tool
Jasper	Image encoding tool
Krb5	Computer network authentication protocol
Linux	Operating system
Openssl	Encryption tool suit
Php-src	Interpreter for php-scripting language
Qemu	System emulator
Tcpdump	Computer network analyzing tool

A.2 Types of vulnerability in *Real-Vul* projects.

Table 2: CWE IDs available in Chromium.

CWE ID	Count
CWE-20	87761
CWE-119	67277
CWE-399	47694
CWE-787	25237
CWE-254	20596
CWE-200	20267
CWE-416	14070
CWE-732	13937
CWE-264	12553
CWE-362	10910
CWE-189	8291
CWE-284	4193
CWE-125	3193
CWE-79	1695
CWE-311	1430
CWE-287	1083
CWE-285	868
CWE-19	622
CWE-22	605
CWE-190	601
CWE-310	394
CWE-17	323
CWE-281	300
CWE-269	260
CWE-704	235
CWE-476	206
CWE-94	110
CWE-77	72
CWE-601	72
CWE-1021	63
CWE-668	26
CWE-862	21
CWE-664	17

Table 3: CWE IDs available in FFmpeg.

CWE ID	Count
CWE-119	1685
CWE-189	219
CWE-369	173
CWE-787	151
CWE-476	120
CWE-125	99
CWE-617	92
CWE-20	51
CWE-834	47
CWE-399	6
CWE-416	6
CWE-665	6
CWE-200	2

Table 4: CWE IDs available in Imagemagick.

CWE ID	Count
CWE-119	4967
CWE-125	437
CWE-20	283
CWE-189	263
CWE-399	233
CWE-772	218
CWE-476	103
CWE-617	63
CWE-22	59
CWE-754	50
CWE-787	50
CWE-284	37
CWE-415	33
CWE-369	29
CWE-416	28
CWE-834	22
CWE-190	10
CWE-835	4
CWE-19	2

Table 5: CWE IDs available in Jasper.

CWE ID	Count
CWE-190	16332
CWE-476	504
CWE-119	122
CWE-125	59
CWE-415	19
CWE-416	7
CWE-20	6

Table 6: CWE IDs available in Krb5.

CWE ID	Count
CWE-119	60358
CWE-617	32732
CWE-18	1204
CWE-415	137
CWE-476	133
CWE-287	54
CWE-264	36
CWE-200	30
CWE-90	19
CWE-255	16
CWE-20	12
CWE-189	6
CWE-284	3

Table 7: CWE IDs available in Linux.

CWE ID	Count
CWE-399	89353
CWE-404	43047
CWE-20	31110
CWE-362	23947
CWE-264	15242
CWE-189	9253
CWE-416	7776
CWE-119	7725
CWE-200	3408
CWE-476	3285
CWE-310	3120
CWE-400	2199
CWE-17	2098
CWE-19	1871
CWE-285	1652
CWE-190	1129
CWE-787	944
CWE-388	752
CWE-125	587
CWE-284	514
CWE-287	426
CWE-415	188
CWE-732	174
CWE-772	146
CWE-59	122
CWE-254	86
CWE-617	82
CWE-704	66
CWE-16	58
CWE-191	48
CWE-120	26
CWE-665	24
CWE-755	23
CWE-835	16
CWE-358	16
CWE-754	15
CWE-862	14
CWE-532	11
CWE-763	9
CWE-129	7
CWE-369	6

Table 8: CWE IDs available in Openssl.

CWE ID	Count
CWE-310	497
CWE-20	448
CWE-190	434
CWE-399	409
CWE-330	231
CWE-119	187
CWE-125	158
CWE-200	144
CWE-254	66
CWE-189	56
CWE-362	28
CWE-320	20
CWE-400	18
CWE-476	17
CWE-17	12
CWE-787	5

Table 9: CWE IDs available in Php-src.

CWE ID	Count
CWE-190	1479
CWE-125	550
CWE-415	506
CWE-119	307
CWE-189	211
CWE-476	183
CWE-20	109
CWE-400	92
CWE-134	46
CWE-416	43
CWE-79	41
CWE-74	20
CWE-918	18
CWE-502	17
CWE-787	7
CWE-264	4

Table 10: CWE IDs available in Qemu.

CWE ID	Count
CWE-125	639
CWE-119	466
CWE-399	380
CWE-20	251
CWE-835	244
CWE-190	89
CWE-200	71
CWE-787	68
CWE-400	62
CWE-617	46
CWE-732	39
CWE-189	28
CWE-264	18
CWE-772	12
CWE-369	3

Table 11: CWE IDs available in Tcpdump.

CWE ID	Count
CWE-125	1641
CWE-835	51
CWE-119	42
CWE-120	32
CWE-674	20
CWE-20	8

A.3 Evaluation results.

Table 12: Evaluation results of DeepWukong, LineVul, and ReVeal model

Research Question	Model Name	Accuracy (%)	Precision (%)	Recall (%)	F1 score (%)
RQ1	DeepWukong	98	87	98	93
	LineVul	96	96	84	90
	ReVeal	81	29	59	38
RQ 2	DeepWukong	91	1	87	2
	LineVul	89	1	90	2
	ReVeal	89	10	80	17
RQ 3 (imbalanced)	DeepWukong	99	0	0	0
	LineVul	99	0	0	0
	ReVeal	95	2	10	3
RQ 3 (balanced)	DeepWukong	89	1	53	2
	LineVul	99	11	99	20
	ReVeal	91	31	45	36

References