

Model-based Automated Testing of JavaScript Web Applications via Longer Test Sequences

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Problems & Ideas

- Problems of Automated Testing of JavaScript Web Applications
 - Low code coverage
- Idea: generating and executing long event sequences to achieve high code coverage

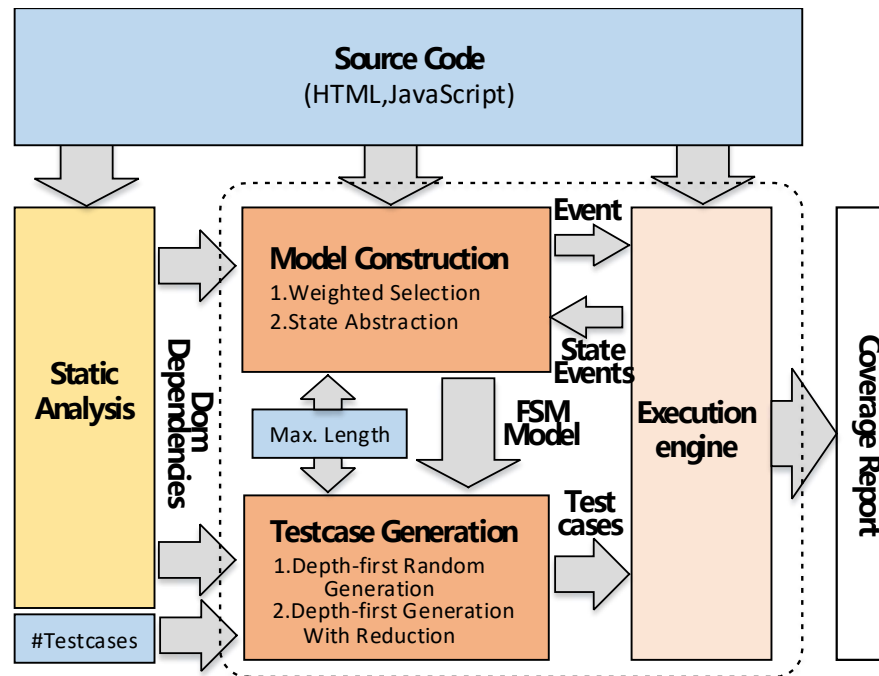


Fig 1. Framework overview of LJS

Main Contributions

- On average, LJS is able to achieve 86.5% line coverage in 10 minutes
- Compared with JSDep, LJS achieves 11-19% higher than JSDep

Table 1 Coverage of LJS and JSDEP in 600 seconds

Name	#Loc	LJS				JSDEP			p-value	Effect size
		Coverage	sd	#Tests	Max. length	Coverage	#Tests	Max. length		
case1	59	100.0%	0.000	4803	99	100.0%	1409	705	NA	NA
case2	72	100.0%	0.000	4470	99	100.0%	3058	549	NA	NA
case3	165	100.0%	0.000	2789	99	100.0%	7811	575	NA	NA
case4	196	87.0%	0.000	2885	99	77.9%	8594	500	$< 1 \times 10^{-5}$	1
frog	567	96.6%	0.006	10	99	84.6%	86	16	5×10^{-5}	1
cosmos	363	87.9%	0.059	268	99	79.5%	973	243	9.6×10^{-4}	0.71
hanoi	246	88.3%	0.013	1470	99	82.5%	902	225	1×10^{-5}	0.95
flipflop	525	97.1%	0.004	60	99	96.3%	284	71	1×10^{-5}	1
sokoban	3056	88.2%	0.027	55	99	77.6%	203	51	5×10^{-5}	1
wormy	570	44.2%	0.052	34	99	41.0%	323	18	0.70512	0.67
chinabox	338	83.7%	0.003	7	99	82.3%	92	9	2×10^{-5}	1
3dmodel	5414	85.0%	0.001	9	99	71.5%	66	10	1×10^{-5}	1
cubuild	1014	87.5%	0.035	8	99	72.8%	153	17	5×10^{-5}	1
pearlski	960	55.1%	0.000	82	99	54.9%	214	52	$< 1 \times 10^{-5}$	1
speedy eater	784	90.0%	0.008	550	99	82.1%	1497	374	6×10^{-5}	1
gallony	300	94.5%	0.001	2395	99	94.5%	1611	95	2.4×10^{-4}	0.05
fullhouse	528	92.1%	0.012	1168	99	86.3%	889	222	3×10^{-5}	1
ball_pool	1745	93.2%	0.005	2	99	74.2%	18	3	6×10^{-5}	1
harehound	468	95.0%	0.004	498	99	94.5%	1224	116	1.3×10^{-4}	0.81
match	369	72.5%	0.002	1142	99	73.2%	4050	845	1×10^{-5}	0
lady	820	79.1%	0.002	0	99	75.7%	35	8	5×10^{-5}	1
Average	883.8	86.5%	0.011	1081	99	81.0%	1595	224	NA	NA

Table 1. Coverage of LJS and JSDEP in 600 seconds