CHAPTER 6

6.1 PROPOSED METHOD

To evaluate the performance of ALO technique, standard IEEE-57 test systems are used . The standard IEEE 57-bus system consists of 80 transmission lines; seven generators at buses. However, the obtained results from the developed ALO algorithm are compared with other well-known optimization methods to proof its effectiveness and superiority. In this method we considered IEEE-57 bus system to perform antlion algorithm and evaluate results.

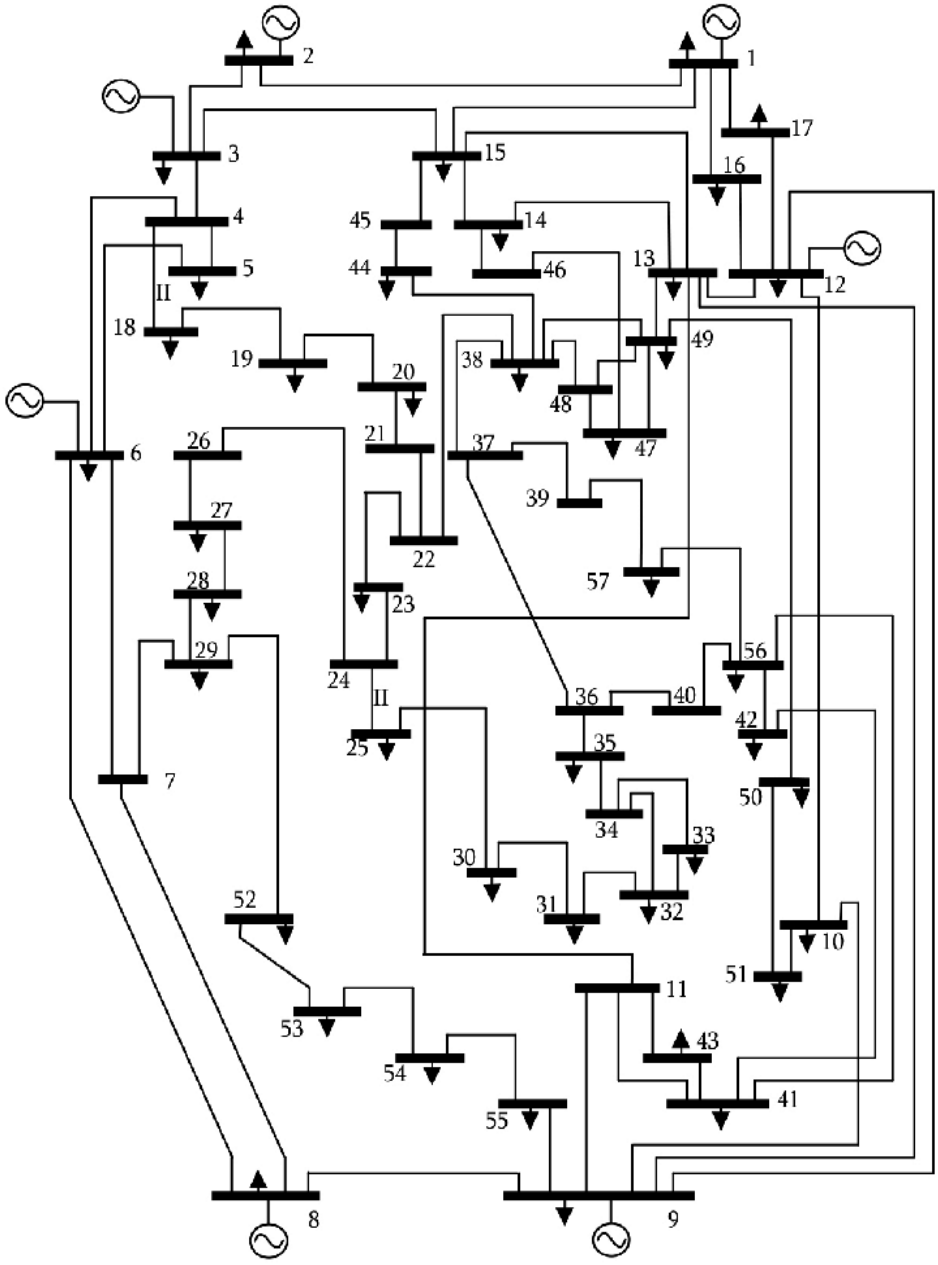


Fig 5.1: Single line diagram of IEEE-57 Bus system

6.2 SYSTEM DATA

6.2.1 BUS DATA

BUSNUMBER	TYPE	VOLTAGE	THETA	P GENERATION	Q GENERATION	PLOAD	QLOAD	QMIN	QMAX	Qsh
1	1	1.04	0	1.289	-0.161	0.55	0.17	0	0	0
2	2	1.01	0	0	-0.008	0.03	0.88	0.5	-0.17	0
3	2	0.985	0	0.4	-0.01	0.41	0.21	0.6	-0.1	0
4	3	1	0	0	0	0	0	0	0	0
5	3	1	0	0	0	0.13	0.04	0	0	0
6	2	0.98	0	0	0.008	0.75	0.02	0.25	-0.08	0
7	3	1	0	0	0	0	0	0	0	0
8	2	1.005	0	4.5	0.621	1.5	0.22	2	-1.4	0
9	2	0.98	0	0	0.022	1.21	0.26	0.09	-0.03	0
10	3	1	0	0	0	0.05	0.02	0	0	0
11	3	1	0	0	0	0	0	0	0	0
12	2	1.015	0	3.1	1.285	3.37	0.24	1.55	-0.5	0
13	3	1	0	0	0	0.18	0.023	0	0	0
14	3	1	0	0	0	0.105	0.053	0	0	0
15	3	1	0	0	0	0.22	0.05	0	0	0
16	3	1	0	0	0	0.43	0.03	0	0	0
17	3	1	0	0	0	0.42	0.08	0	0	0
18	3	1	0	0	0	0.272	0.098	0	0	0.1
19	3	1	0	0	0	0.033	0.006	0	0	0
20	3	1	0	0	0	0.023	0.01	0	0	0
21	3	1	0	0	0	0	0	0	0	0
22	3	1	0	0	0	0	0	0	0	0

23	3	1	0	0	0	0.063	0.021	0	0	0
24	3	1	0	0	0	0	0	0	0	0
25	3	1	0	0	0	0.063	0.032	0	0	0.059
26	3	1	0	0	0	0	0	0	0	0
27	3	1	0	0	0	0.093	0.005	0	0	0
28	3	1	0	0	0	0.046	0.023	0	0	0
29	3	1	0	0	0	0.17	0.026	0	0	0
30	3	1	0	0	0	0.036	0.018	0	0	0
31	3	1	0	0	0	0.058	0.029	0	0	0
32	3	1	0	0	0	0.016	0.008	0	0	0
33	3	1	0	0	0	0.038	0.019	0	0	0
34	3	1	0	0	0	0	0	0	0	0
35	3	1	0	0	0	0.06	0.03	0	0	0
36	3	1	0	0	0	0	0	0	0	0
37	3	1	0	0	0	0	0	0	0	0
38	3	1	0	0	0	0.14	0.07	0	0	0
39	3	1	0	0	0	0	0	0	0	0
40	3	1	0	0	0	0	0	0	0	0
41	3	1	0	0	0	0.063	0.03	0	0	0
42	3	1	0	0	0	0.071	0.044	0	0	0
43	3	1	0	0	0	0.02	0.01	0	0	0
44	3	1	0	0	0	0.12	0.018	0	0	0
45	3	1	0	0	0	0	0	0	0	0
46	3	1	0	0	0	0	0	0	0	0
47	3	1	0	0	0	0.297	0.116	0	0	0
48	3	1	0	0	0	0	0	0	0	0
49	3	1	0	0	0	0.18	0.085	0	0	0
50	3	1	0	0	0	0.21	0.105	0	0	0

51	3	1	0	0	0	0.18	0.053	0	0	0
52	3	1	0	0	0	0.049	0.022	0	0	0
53	3	1	0	0	0	0.2	0.1	0	0	0.063
54	3	1	0	0	0	0.041	0.014	0	0	0
55	3	1	0	0	0	0.068	0.034	0	0	0
56	3	1	0	0	0	0.076	0.022	0	0	0
57	3	1	0	0	0	0.067	0.02	0	0	0

6.2.2 LINE DATA

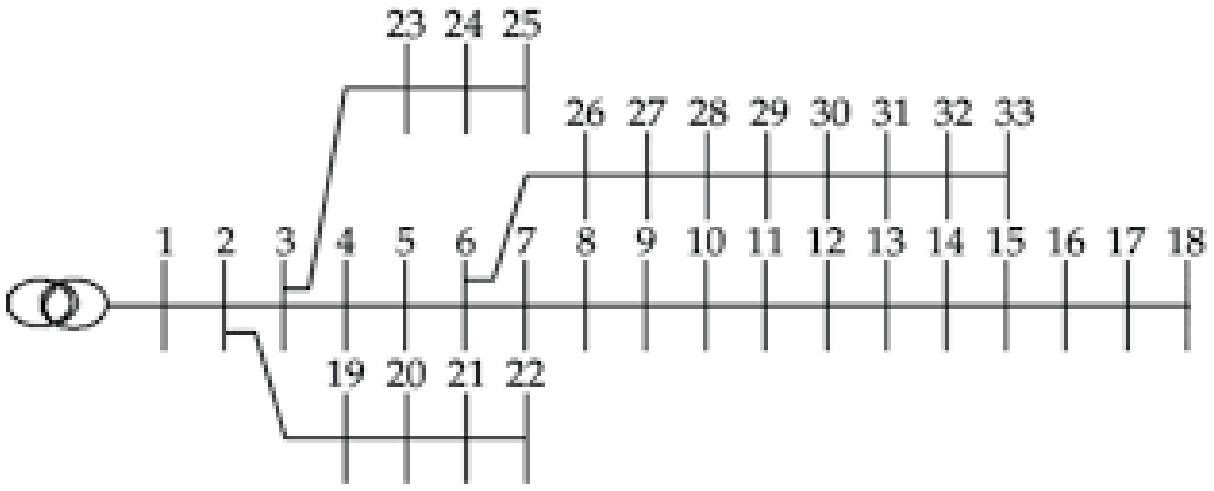
LINE NUMBER	FROM BUS	TO BUS	RESISTANCE	REACTANCE	TAP	LINELIMIT	LINE CHARGING(B/2)
1	1	2	0.0083	0.028	1	100 MVA	0.0645
2	2	3	0.0298	0.085	1	50 MVA	0.0409
3	3	4	0.0112	0.0366	1	100 MVA	0.019
4	4	5	0.0625	0.132	1	150 MVA	0.0129
5	4	6	0.043	0.148	1	100 MVA	0.0174
6	6	7	0.02	0.102	1	125 MVA	0.0138
7	6	8	0.0339	0.173	1	150 MVA	0.0235
8	8	9	0.0099	0.0505	1	175 MVA	0.0274
9	9	10	0.0369	0.1679	1	25 MVA	0.022
10	9	11	0.0258	0.0848	1	30 MVA	0.0109
11	9	12	0.0648	0.295	1	45 MVA	0.0386
12	9	13	0.0481	0.158	1	120 MVA	0.0203
13	13	14	0.0132	0.0434	1	110 MVA	0.0055
14	13	15	0.0269	0.0869	1	75 MVA	0.0115
15	1	15	0.0178	0.091	1	100 MVA	0.0494
16	1	16	0.0454	0.206	1	100 MVA	0.0273

17	1	17	0.0238	0.108	1	100 MVA	0.0143
18	3	15	0.0162	0.053	1	100 MVA	0.0272
19	4	18	0	0.555	0.97	100 MVA	0
20	4	18	0	0.43	0.978	100 MVA	0
21	5	6	0.0302	0.0641	1	150 MVA	0.0062
22	7	8	0.0139	0.0712	1	100 MVA	0.0097
23	10	12	0.0277	0.1262	1	100 MVA	0.0164
24	11	13	0.0223	0.0732	1	100 MVA	0.0094
25	12	13	0.0178	0.058	1	100 MVA	0.0302
26	12	16	0.018	0.0813	1	100 MVA	0.0108
27	12	17	0.0397	0.179	1	100 MVA	0.0238
28	14	15	0.0171	0.0547	1	100 MVA	0.0074
29	18	19	0.461	0.685	1	100 MVA	0
30	19	20	0.283	0.434	1	100 MVA	0
31	21	20	0	0.7767	1.043	100 MVA	0
32	21	22	0.0736	0.117	1	100 MVA	0
33	22	23	0.0099	0.0152	1	100 MVA	0
34	23	24	0.166	0.256	1	100 MVA	0.0042
35	24	25	0	1.182	1	100 MVA	0
36	24	25	0	1.23	1	100 MVA	0
37	24	26	0	0.0473	1.043	100 MVA	0
38	26	27	0.165	0.254	1	100 MVA	0
39	27	28	0.0618	0.0954	1	100 MVA	0
40	28	29	0.0418	0.0587	1	100 MVA	0
41	7	29	0	0.0648	0.967	100 MVA	0
42	25	30	0.135	0.202	1	100 MVA	0
43	30	31	0.326	0.497	1	100 MVA	0

44	31	32	0.507	0.755	1	100 MVA	0
45	32	33	0.0392	0.036	1	100 MVA	0
46	34	32	0	0.953	0.975	100 MVA	0
47	34	35	0.052	0.078	1	100 MVA	0.0016
48	35	36	0.043	0.0537	1	100 MVA	0.0008
49	36	37	0.029	0.0366	1	100 MVA	0
50	37	38	0.0651	0.1099	1	100 MVA	0.001
51	37	39	0.0239	0.0379	1	100 MVA	0
52	36	40	0.03	0.0466	1	100 MVA	0
53	22	38	0.0192	0.0295	1	100 MVA	0
54	11	41	0	0.749	0.955	100 MVA	0
55	41	42	0.207	0.352	1	100 MVA	0
56	41	43	0	0.412	1	100 MVA	0
57	38	44	0.0289	0.0585	1	100 MVA	0.001
58	15	45	0	0.1042	0.955	100 MVA	0
59	14	46	0	0.0735	0.9	100 MVA	0
60	46	47	0.023	0.068	1	100 MVA	0.0016
61	47	48	0.0182	0.0233	1	100 MVA	0
62	48	49	0.0834	0.129	1	100 MVA	0.0024
63	49	50	0.0801	0.128	1	100 MVA	0
64	50	51	0.1386	0.22	1	100 MVA	0
65	10	51	0	0.0712	0.93	100 MVA	0
66	13	49	0	0.191	0.895	100 MVA	0
67	29	52	0.1442	0.187	1	100 MVA	0
68	52	53	0.0762	0.0984	1	100 MVA	0
69	53	54	0.1878	0.232	1	100 MVA	0
70	54	55	0.1732	0.2265	1	100 MVA	0

71	11	43	0	0.153	0.958	100 MVA	0
72	44	45	0.0624	0.1249	1	100 MVA	0.002
73	40	56	0	1.195	0.958	100 MVA	0
74	56	41	0.553	0.549	1	100 MVA	0
75	56	42	0.2125	0.354	1	100 MVA	0
76	39	57	0	1.355	0.98	100 MVA	0
77	57	56	0.174	0.26	1	100 MVA	0
78	38	49	0.115	0.177	1	100 MVA	0
79	38	48	0.0312	0.0482	1	100 MVA	0.0015
80	9	55	0	0.1205	0.94	100 MVA	0

IEEE-33 BUS SYSTEM



Line data

Branch no	Sending Bus	Receiving Bus	Resistance	Reactance	P (kW)	Q(kVAr)
1	1	2	0.0922	0.047	100	60
2	2	3	0.493	0.2511	90	40
3	3	4	0.366	0.1864	120	80
4	4	5	0.3811	0.1941	60	30
5	5	6	0.819	0.707	60	20
6	6	7	0.1872	0.6188	200	100
7	7	8	0.7114	0.2351	200	100
8	8	9	1.03	0.74	60	20
9	9	10	1.044	0.74	60	20
10	10	11	0.1966	0.065	45	30
11	11	12	0.3744	0.1298	60	35
12	12	13	1.468	1.155	60	35
13	13	14	0.5416	0.7129	120	80
14	14	15	0.591	0.526	60	10
15	15	16	0.7463	0.545	60	20
16	16	17	1.289	1.721	60	20
17	17	18	0.732	0.574	90	40
18	2	19	0.164	0.1565	90	40
19	19	20	1.5042	1.3554	90	40
20	20	21	0.4095	0.4784	90	40
21	21	22	0.7089	0.9373	90	40
22	3	23	0.4512	0.3083	90	50
23	23	24	0.898	0.7091	420	200
24	24	25	0.896	0.7011	420	200
25	6	26	0.203	0.1034	60	25
26	26	27	0.2842	0.1447	60	25
27	27	28	1.059	0.9337	60	20
28	28	29	0.8042	0.7006	120	70
29	29	30	0.5075	0.2585	200	600
30	30	31	0.9744	0.963	150	70
31	31	32	0.3105	0.3619	210	100
32	32	33	0.341	0.5302	60	40