Scalable Multi-Period Optimal Power Flow
for Active Power Distribution Systems

or simply, Scalable MP-OPF in ADS

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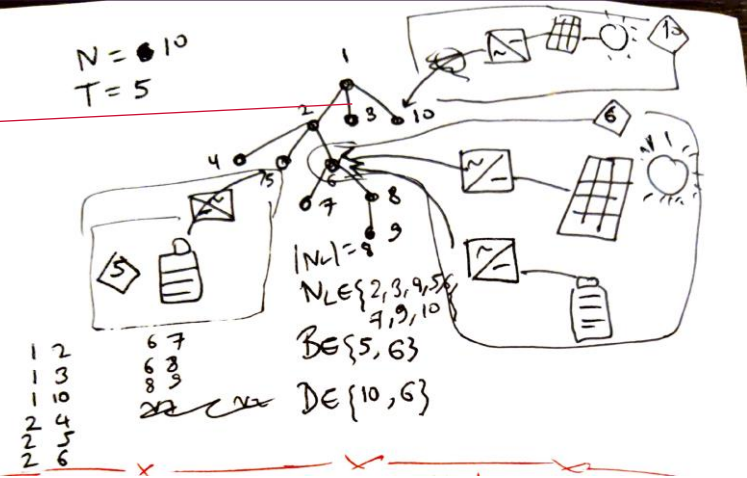*Graduate Research Assistant*

Washington State University

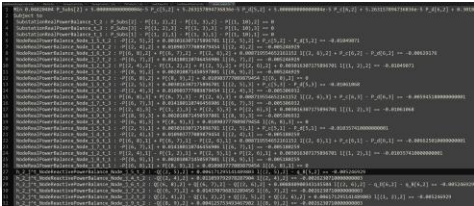Currently converging .. to a non-sensible solution (zero substation power)

Hmm no reason for no GED load node 3 to have power backflow

	A	B	C	D
P_Subs	1.8758E-06	1.8758E-06	2.9121E-07
P_ij_1_2	0.04324176	0.04336758	0.043435
P_ij_1_3	-0.0963712	-0.1247669	-0.152222
P_ij_1_10	0.0531313	0.08140119	0.10878731
P_ij_2_4	0.0051806	0.00524728	0.00530729
P_ij_2_5	0.01059124	0.01071679	0.01083031
P_ij_2_6	0.01710548	0.01690571	0.01667959
P_ij_6_7	0.00518071	0.00524739	0.0053074
P_ij_6_8	0.00518067	0.00524735	0.00530736
P_ij_8_9	0.00518032	0.00524699	0.005307
Q_ij_1_2	0.02452973	0.02469825	0.0248172
Q_ij_1_3	0.76172701	0.75924526	0.72982322
Q_ij_1_10	0.74301089	0.7310482	0.72938127
Q_ij_2_4	0.00259009	0.00262343	0.00265344
Q_ij_2_5	0.00564825	0.0057106	0.00576685
Q_ij_2_6	0.01109675	0.01110281	0.01107543
Q_ij_6_7	0.0025902	0.00262354	0.00265355
Q_ij_6_8	0.00259022	0.00262356	0.00265357
Q_ij_8_9	0.00258987	0.0026232	0.00265321
I_ij_1_2	0.00232968	0.00234777	0.00235884
I_ij_1_3	0.55567478	0.55803571	0.52390744
I_ij_1_10	0.52303521	0.50999864	0.51261348
I_ij_2_4	3.1638E-05	3.2458E-05	3.3205E-05
I_ij_2_5	0.00013588	0.00013907	0.00014199
I_ij_2_6	0.00039208	0.0003858	0.00037806
I_ij_6_7	3.1655E-05	3.2475E-05	3.3222E-05
I_ij_6_8	3.1654E-05	3.2474E-05	3.3221E-05
I_ij_8_9	3.1654E-05	3.2474E-05	3.3221E-05
v_j_1	1.0609	1.0609	1.0609
v_j_2	1.06033649	1.06033365	1.06033178
v_j_3	1.04917744	1.04944691	1.05014941
v_j_4	1.06016623	1.0601612	1.06015735
v_j_5	1.06020289	1.06019852	1.06019527
v_j_6	1.05984203	1.05984257	1.05984512
v_j_7	1.05962067	1.05961836	1.05961835
v_j_8	1.05967177	1.05967012	1.0596707
v_j_9	1.05962957	1.05962737	1.05962746
v_j_10	1.04863475	1.04838636	1.04799378
q_D_j_6	-0.0006424	-0.0005141	-0.0003656
q_D_j_10	-9.92E-20	-2.957E-20	1.414E-20
q_B_j_5	-0.0004672	-0.0004628	-0.000459
q_B_j_6	-9.022E-05	-9.127E-05	-9.243E-05
P_c_j_5	0.00232271	0.00231872	0.00231539
P_c_j_6	0.00118916	0.00118925	0.00118951
P_d_j_5	0.00208929	0.00209305	0.00209618
P_d_j_6	0.00107349	0.0010734	0.00107316
B_j_5	0.01167107	0.01167064	0.01166375
B_j_6	0.00583334	0.00583323	0.00583363

New MPOPF Implementation Progress

Of course, SCD is also there.

Also checking out the constraints used

Current thoughts:
Bad sign in constraints?
Bad per-unit-ization of a parameter?

Battery at Bus 5
Charging and Discharging

Charging
Discharging

SOC

Battery State of Charge

Battery at Bus 6
Charging and Discharging

Charging
Discharging

SOC

Battery State of Charge
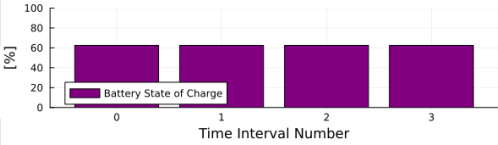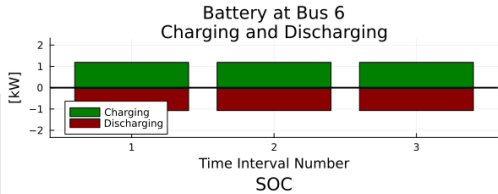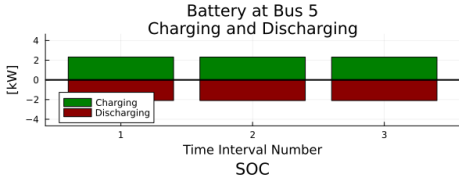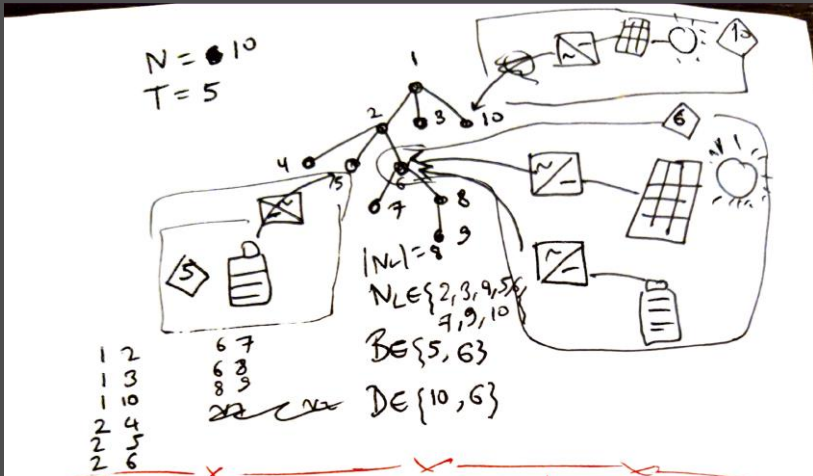
New MPOPF Implementation Progress

- 'New' because now it is being done in a new codebase which:
  - Is easy to work with, is simple to modify and debug
  - Uses OpenDSS .dss files for modelling all components
  - (To do) Post Optimization uses OpenDSSDirect to verify optimization simulation.

ADS10_1ph with 8 Loads, 2 PVs and 2 Batteries