WASHINGTON STATE
UNIVERSITY

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

or simply, Scalable MP-OPF in ADS

Aryan Ritwajeet Jha

Graduate Research Assistant

Washington State University

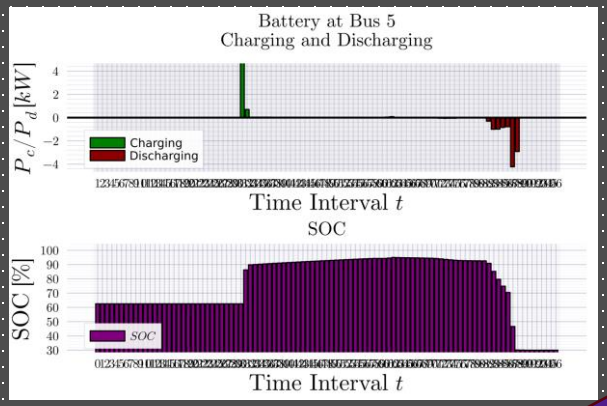
DDP Trajectory vs #Forward Passes $[k]$

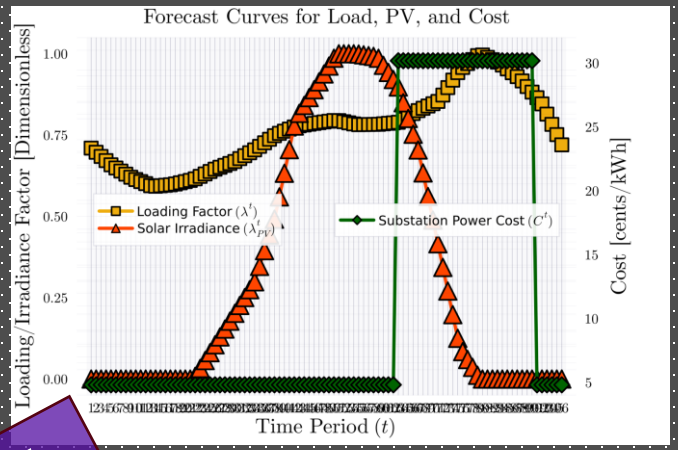
Terminal SOC Constraint Relaxed

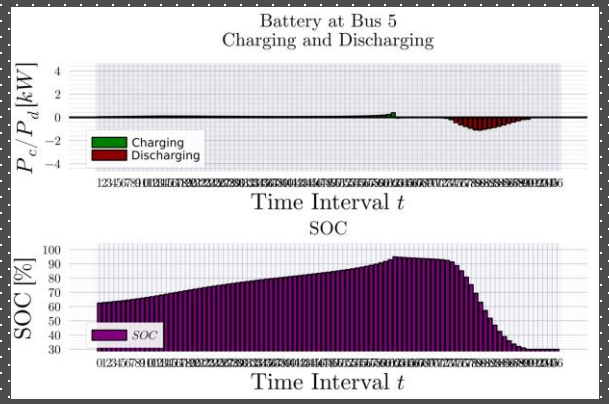
$ADS10_{1ph}$, $T = 96$

DDP

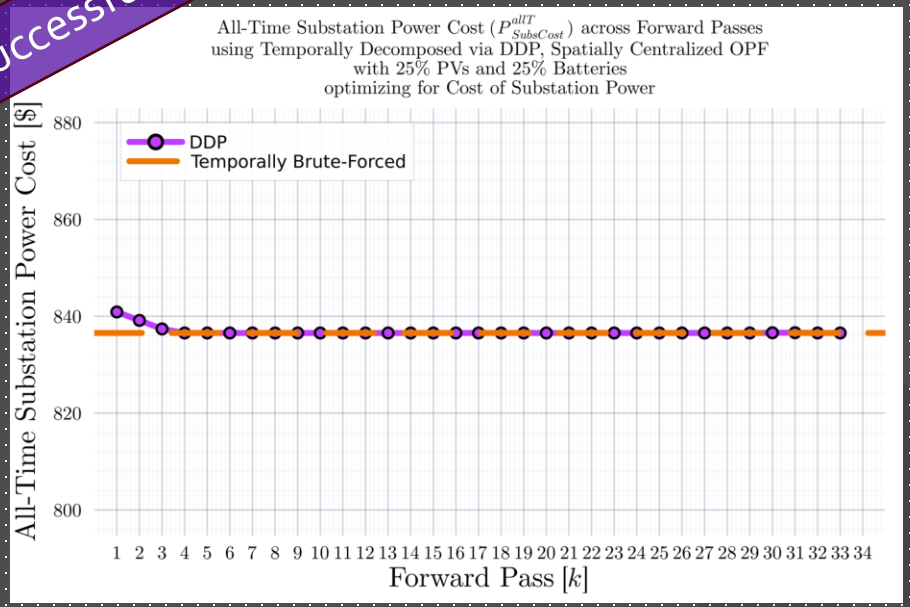
BruteForced (BF)

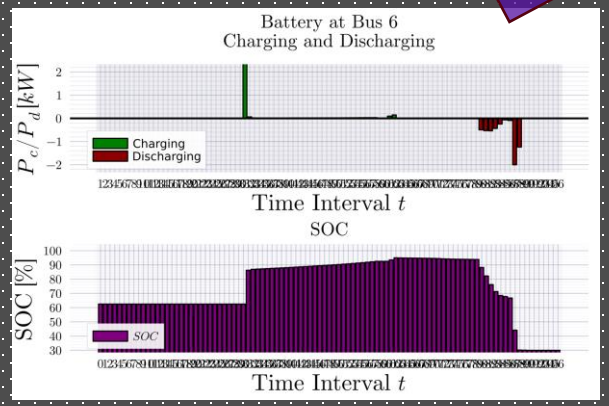


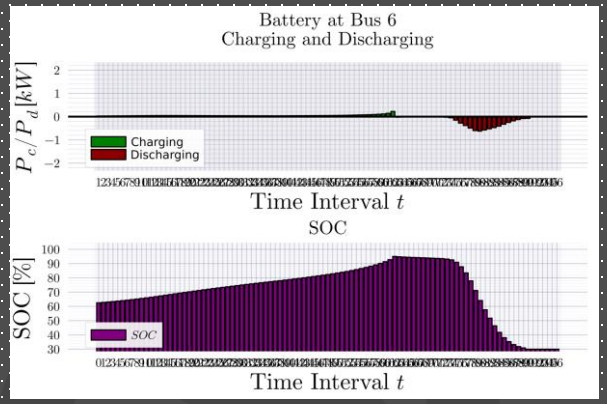




Looks 'successful'







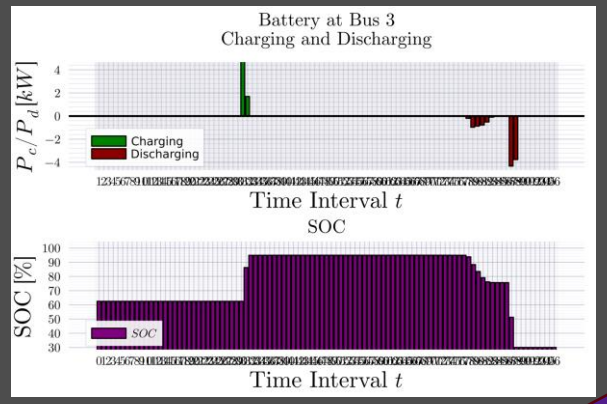
$k_{Max} = 33$

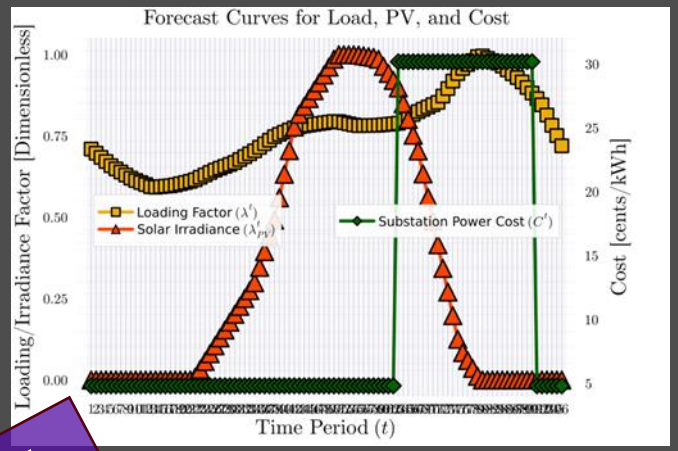
$IEEE123_{1ph}$, $T = 96$

DDP Trajectory vs #Forward Passes $[k]$

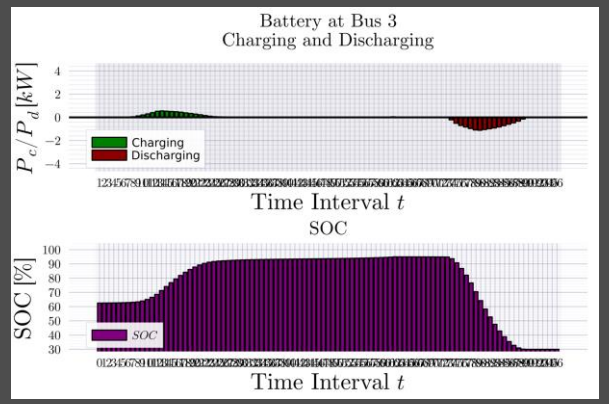
Terminal SOC Constraint Relaxed

DDP

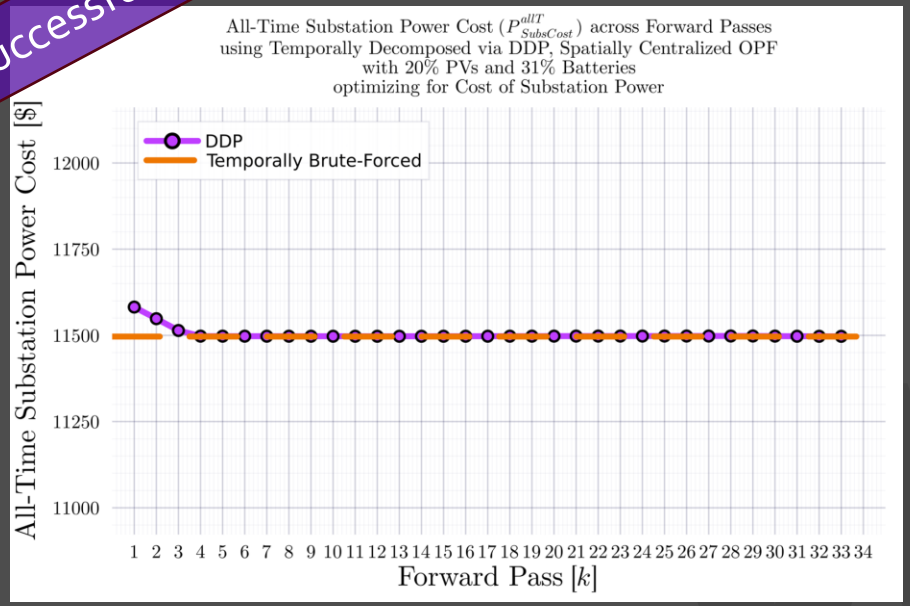


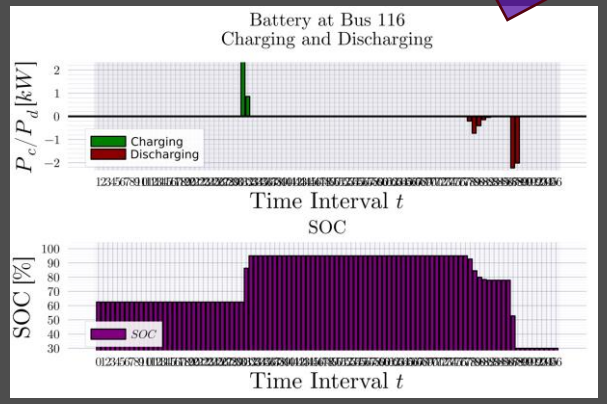


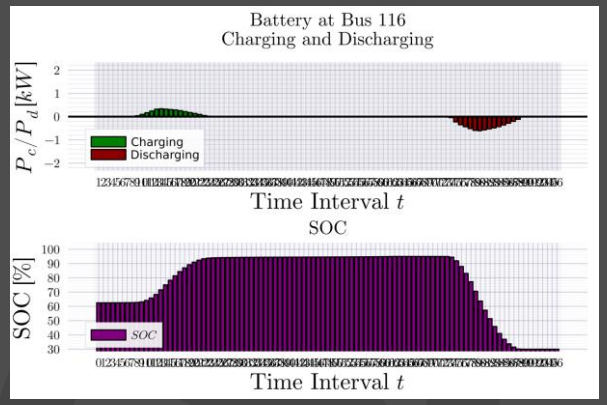
BruteForced (BF)



Looks 'successful'







$k_{Max} = 33$

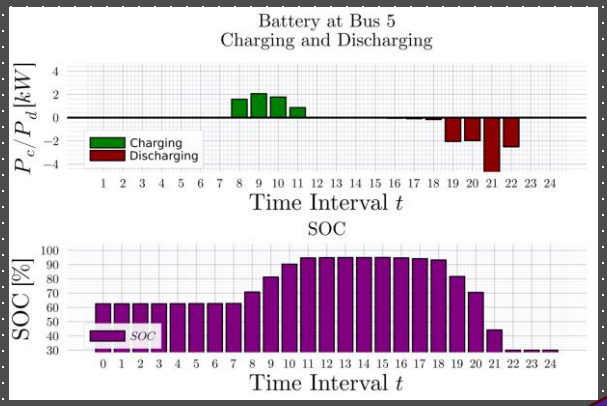
DDP Trajectory vs #Forward Passes $[k]$

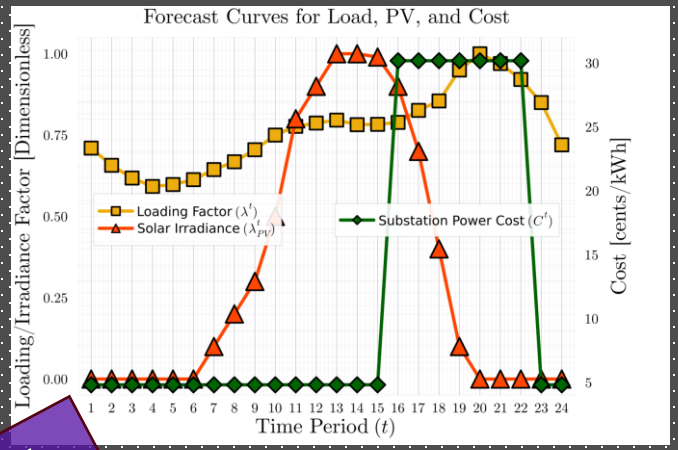
Terminal SOC Constraint Relaxed

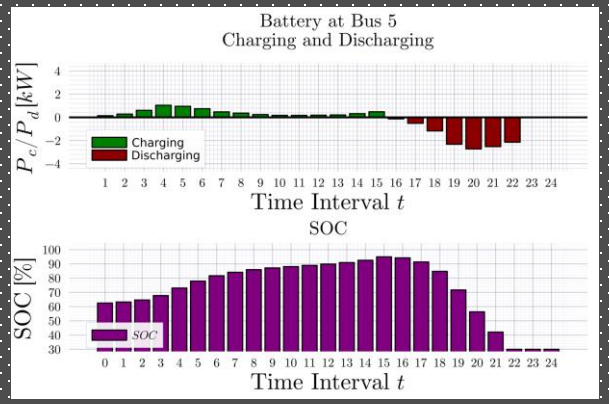
$ADS10_{1ph}$, $T = 24$

DDP

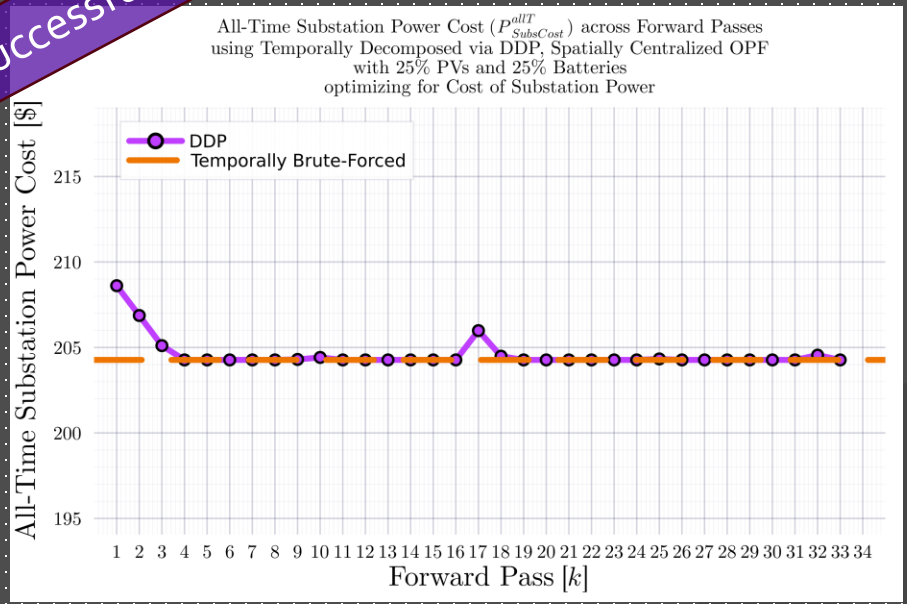
BruteForced (BF)

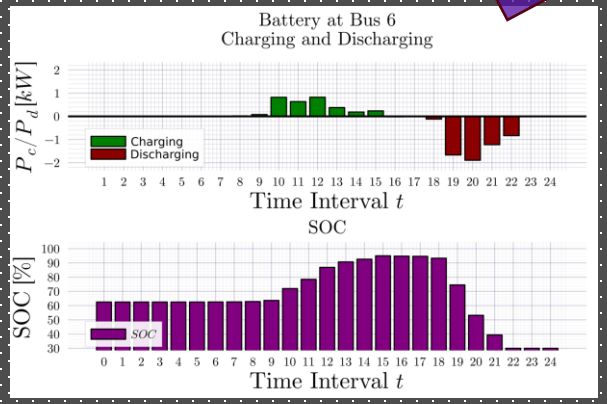


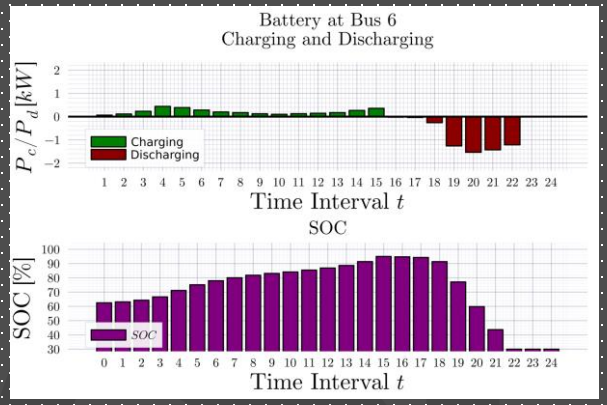




Looks 'successful'







$k_{Max} = 33$

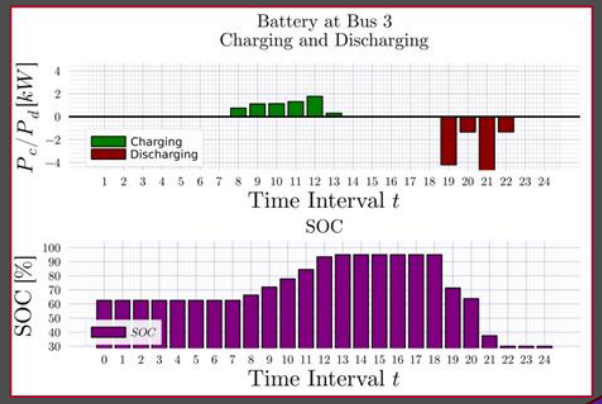
$IEEE123_{1ph}$, $T = 24$

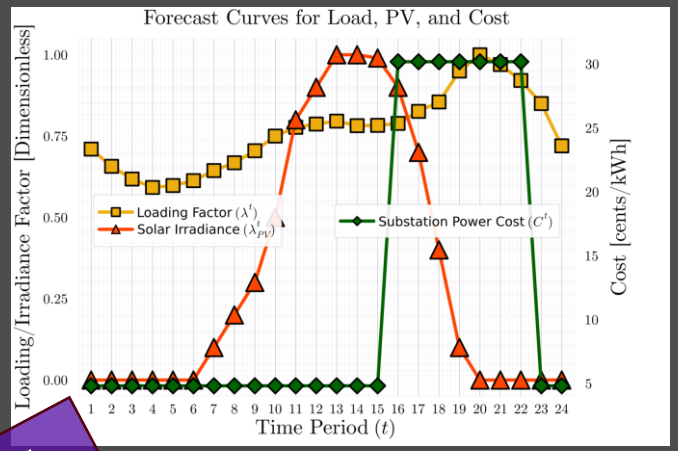
DDP Trajectory vs #Forward Passes $[k]$

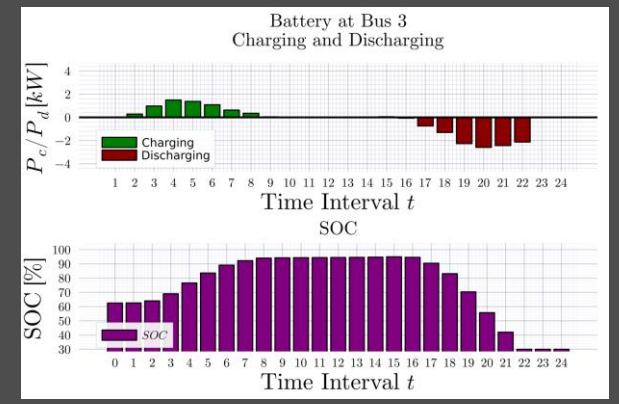
Terminal SOC Constraint Relaxed

DDP

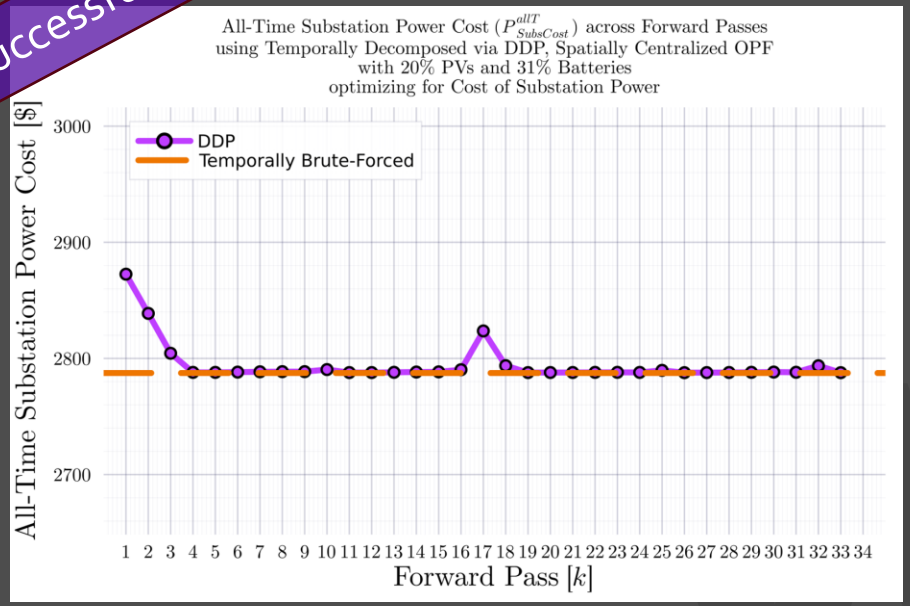
BruteForced (BF)

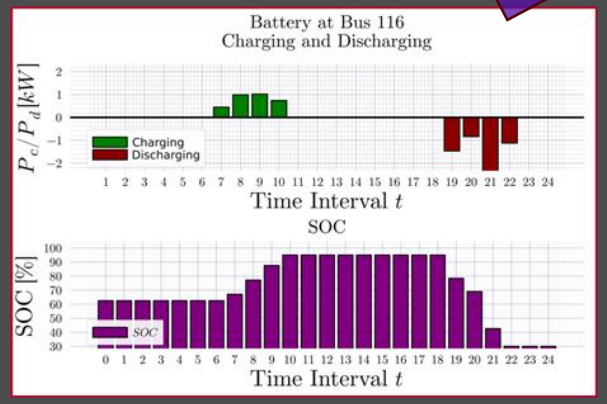


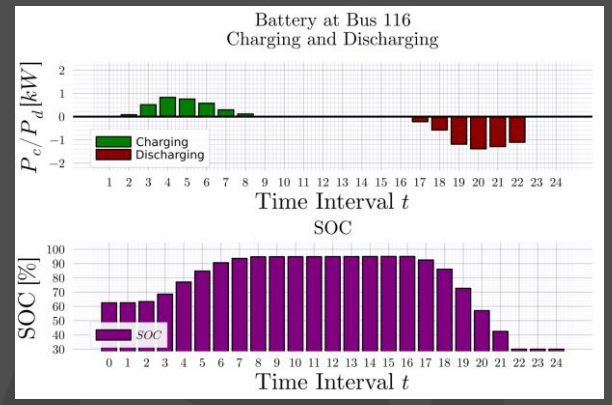




Looks 'successful'







$k_{Max} = 33$

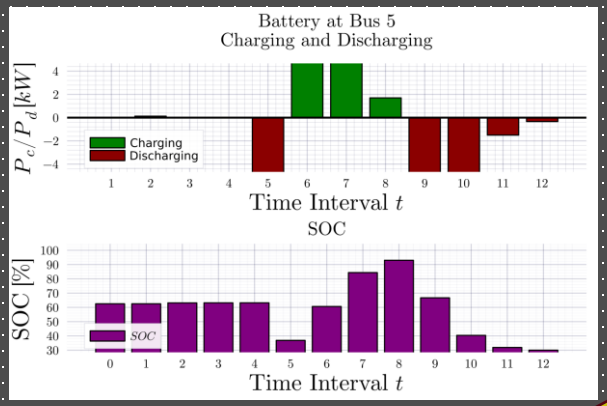
DDP Trajectory vs #Forward Passes $[k]$

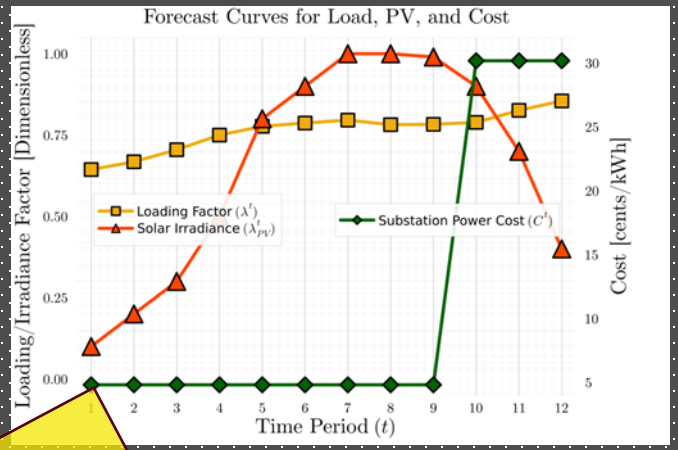
Terminal SOC Constraint Relaxed

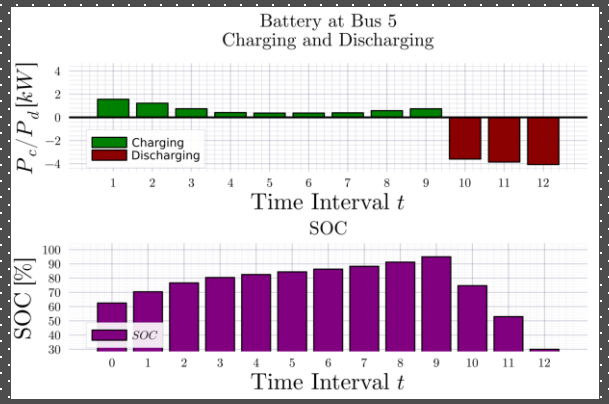
$ADS10_{1ph}$, $T = 12$

DDP

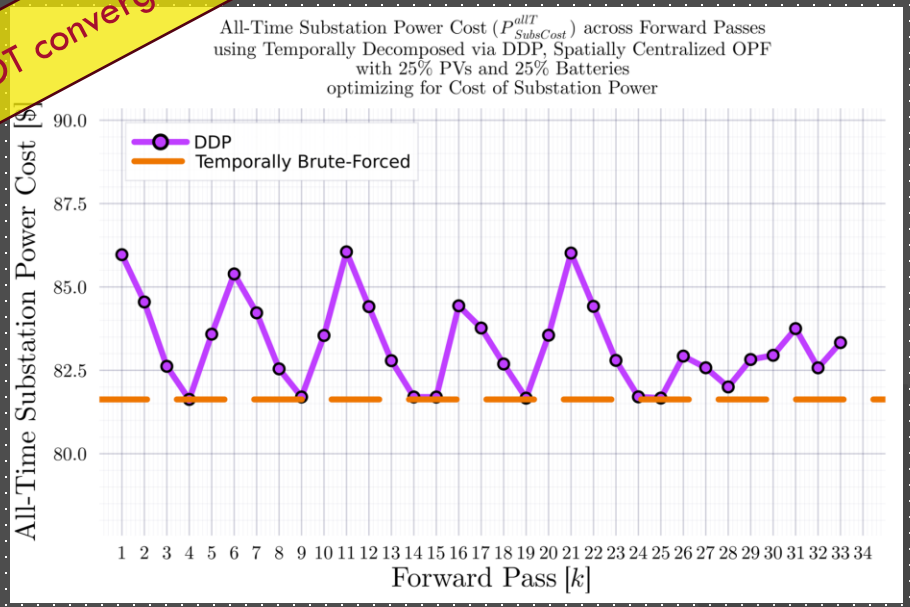
BruteForced (BF)

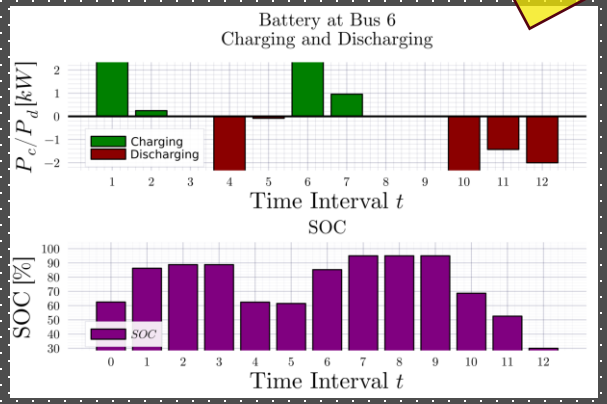


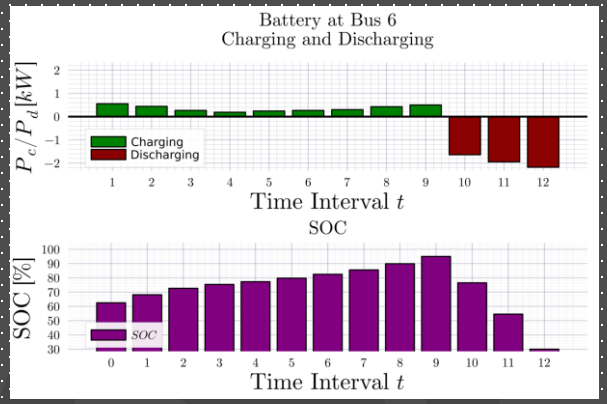




Will NOT converge







$k_{Max} = 33$

Even if not converging, it at least does 'hit' the optimal value periodically.

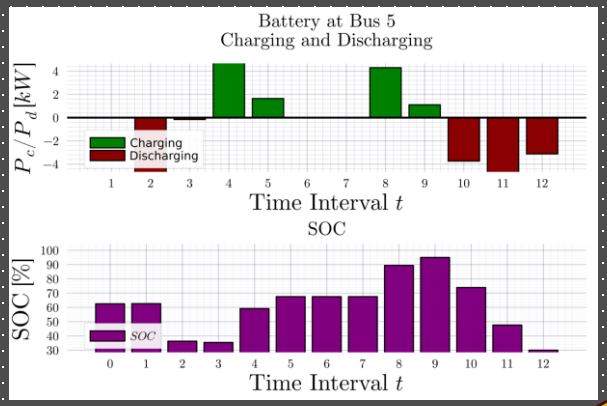
DDP Trajectory vs #Forward Passes $[k]$

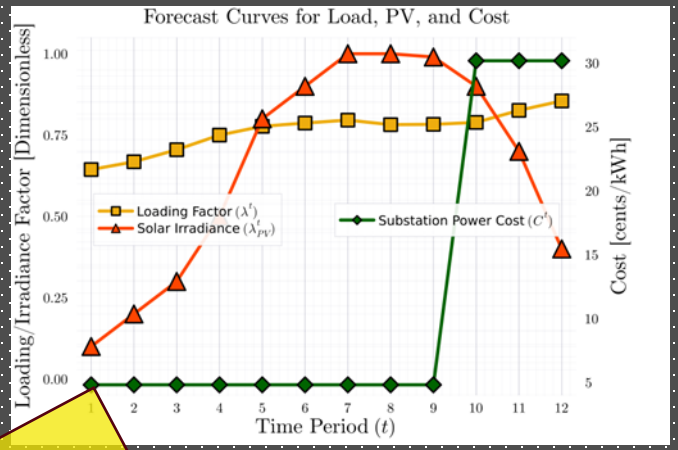
Terminal SOC Constraint Relaxed

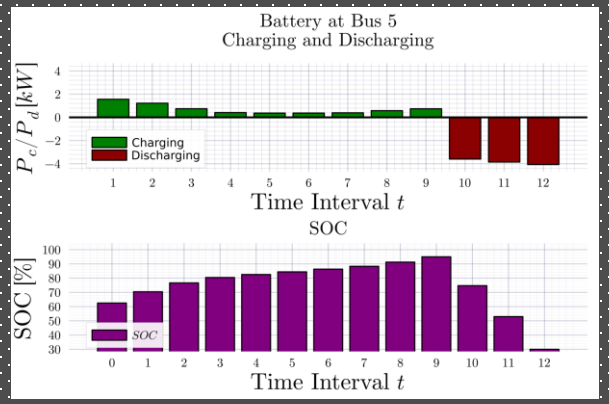
$ADS10_{1ph}$, $T = 12$

DDP

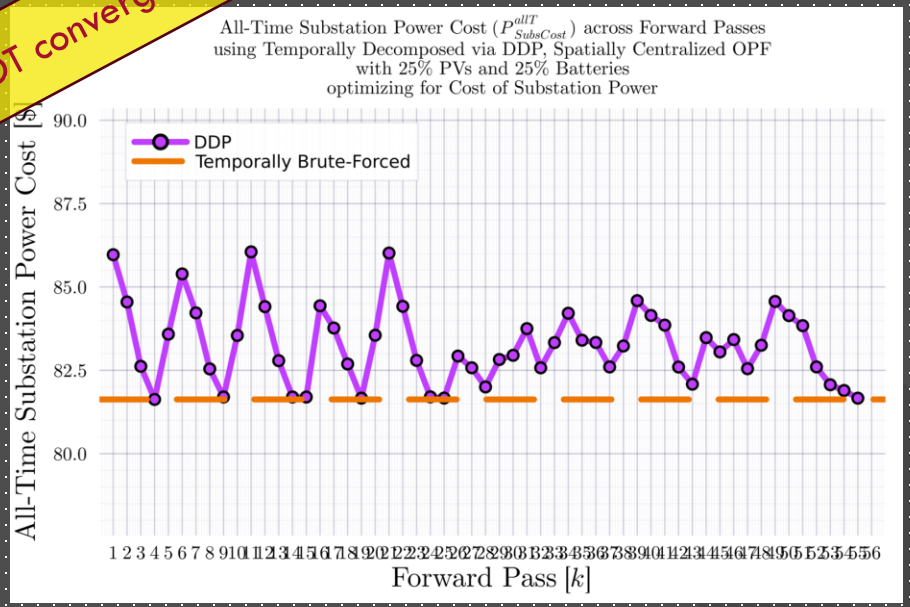
BruteForced (BF)

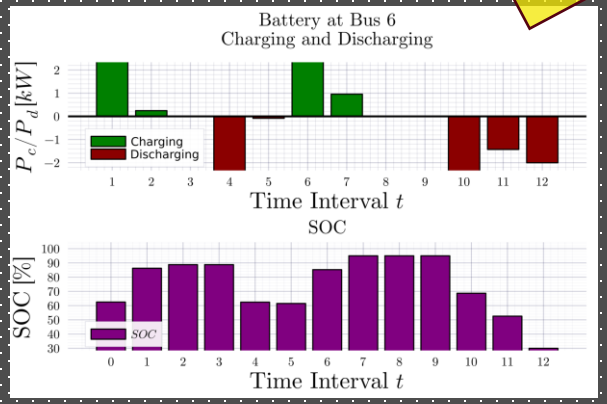


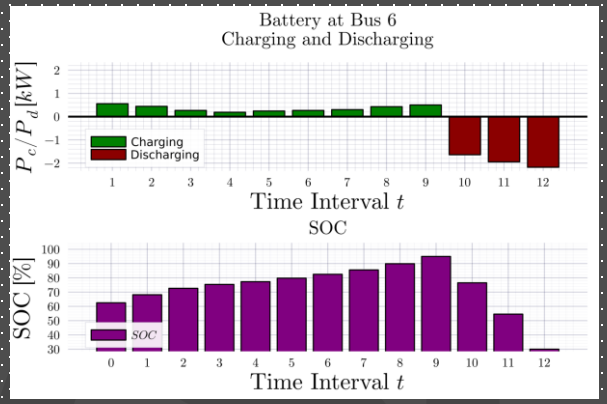




Will NOT converge







$k_{Max} = 55$

Even if not converging, it at least does 'hit' the optimal value periodically.

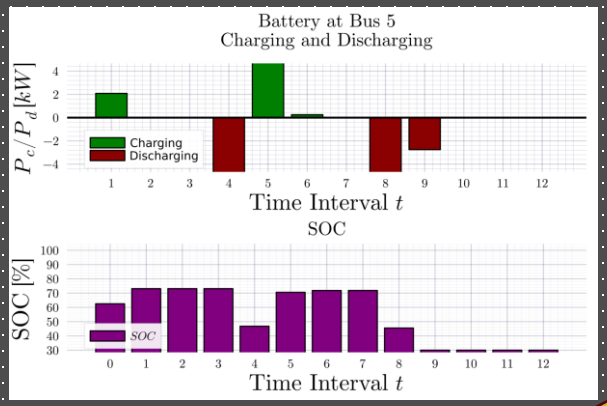
DDP Trajectory vs #Forward Passes $[k]$

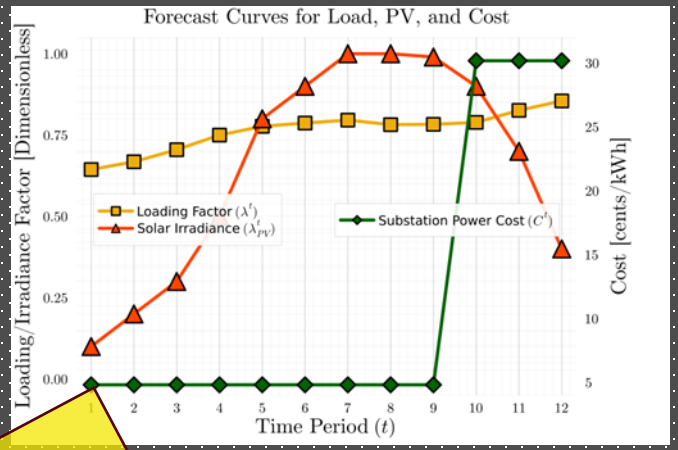
Terminal SOC Constraint Relaxed

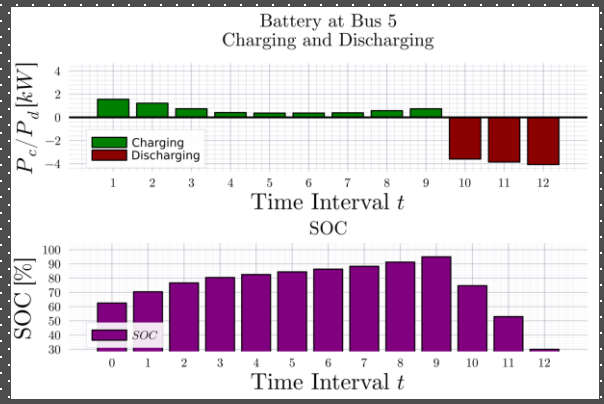
$ADS10_{1ph}$, $T = 12$

DDP

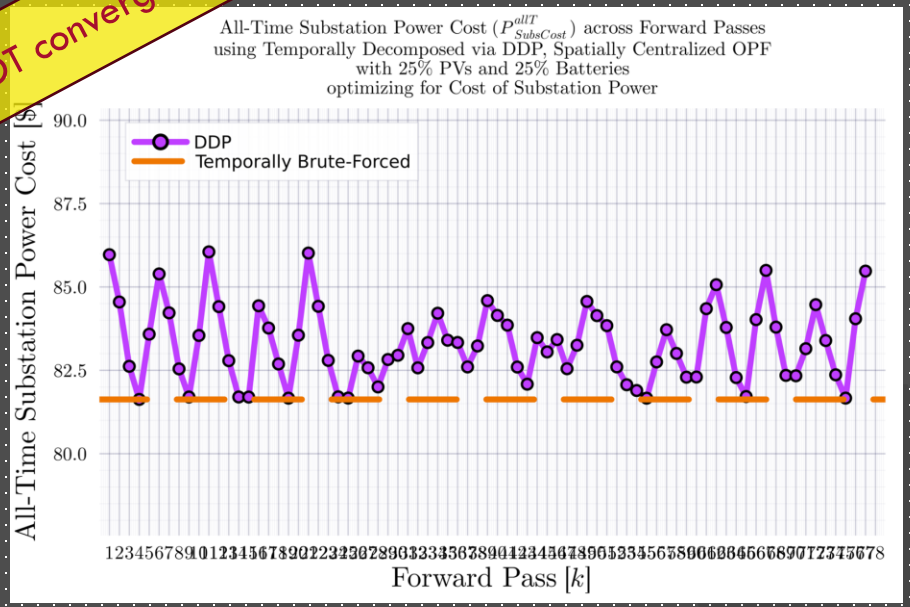
BruteForced (BF)

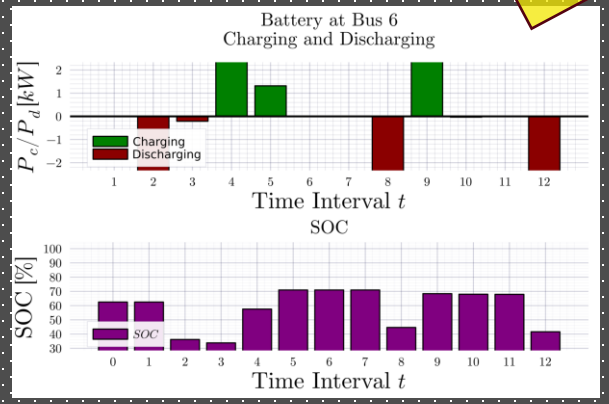


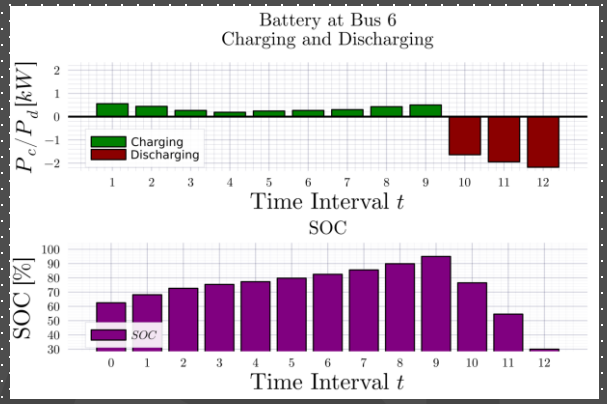




Will NOT converge







$k_{Max} = 77$

Even if not converging, it at least does 'hit' the optimal value periodically.

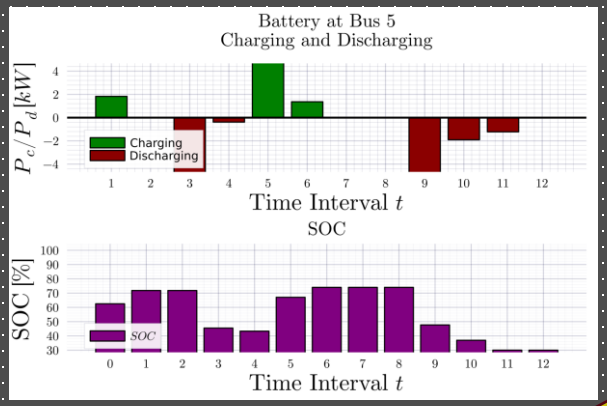
DDP Trajectory vs #Forward Passes $[k]$

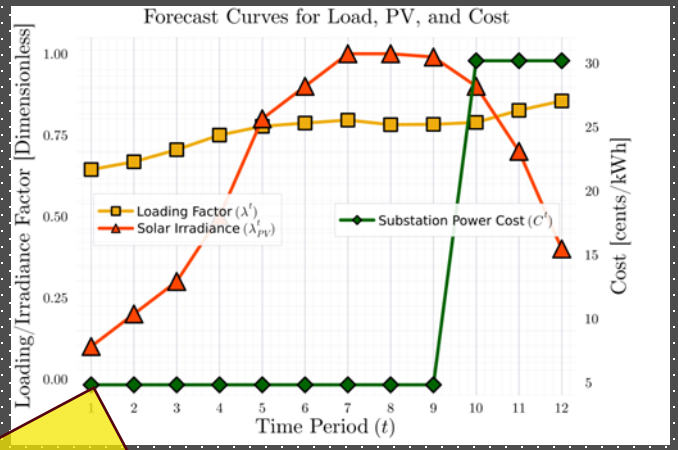
Terminal SOC Constraint Relaxed

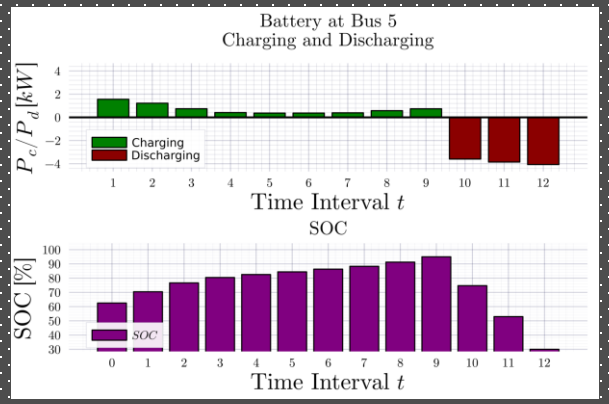
$ADS10_{1ph}$, $T = 12$

DDP

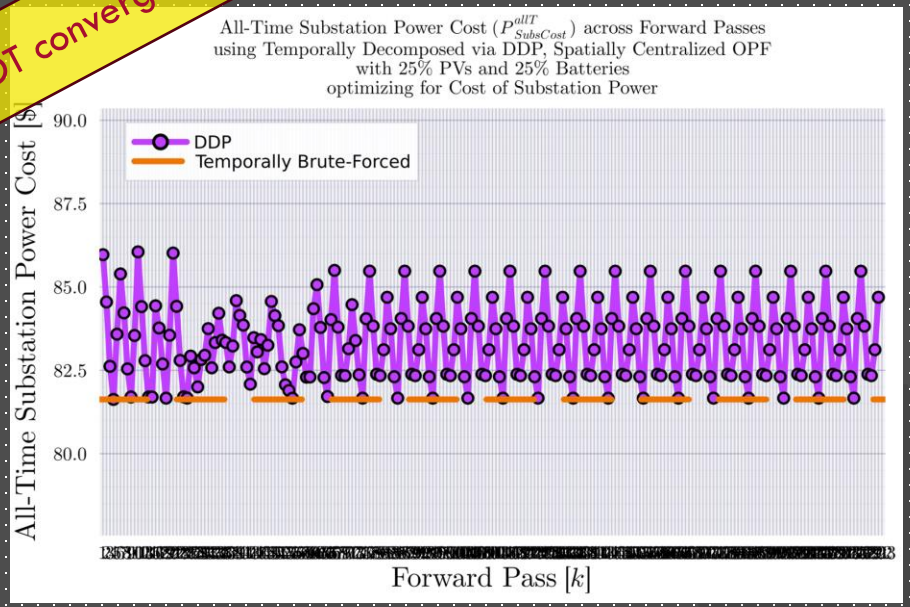
BruteForced (BF)

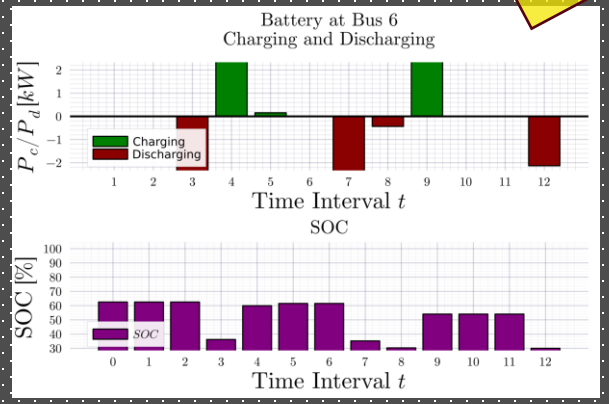


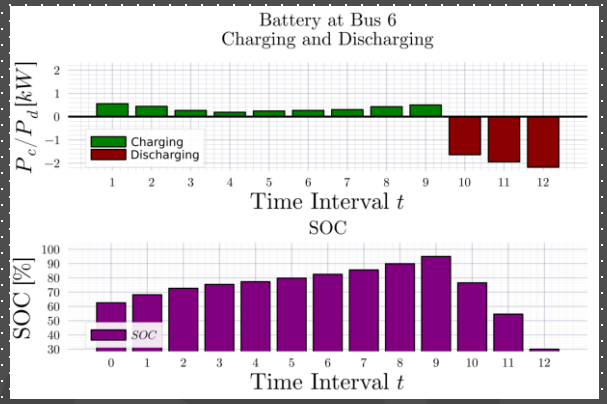




Will NOT converge







$k_{Max} = 222$

Even if not converging, it at least does 'hit' the optimal value periodically.

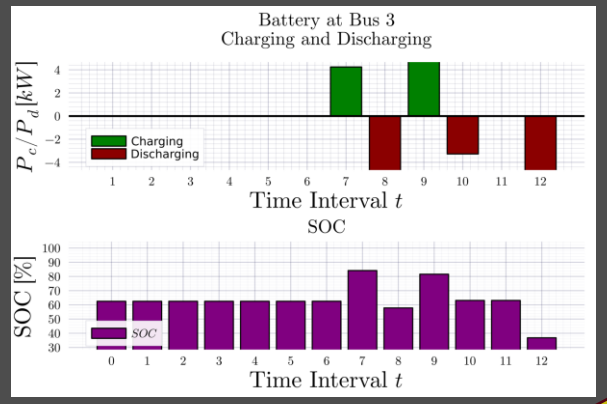
$IEEE123_{1ph}$, $T = 12$

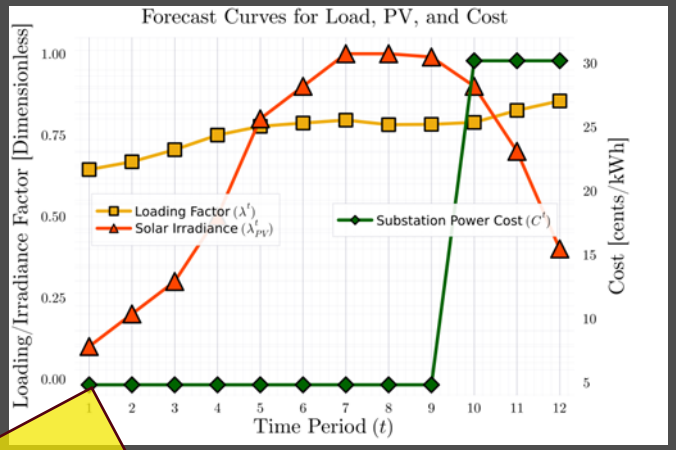
DDP Trajectory vs #Forward Passes $[k]$

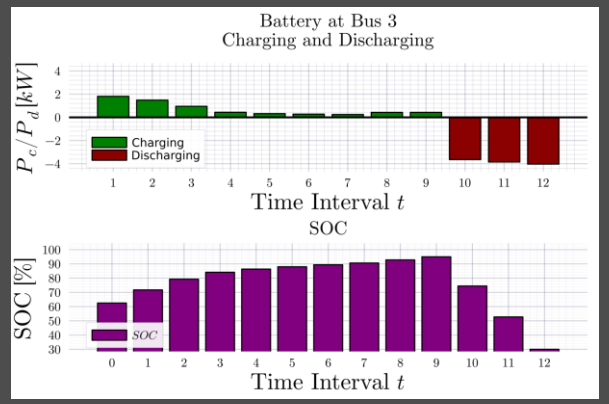
Terminal SOC Constraint Relaxed

DDP

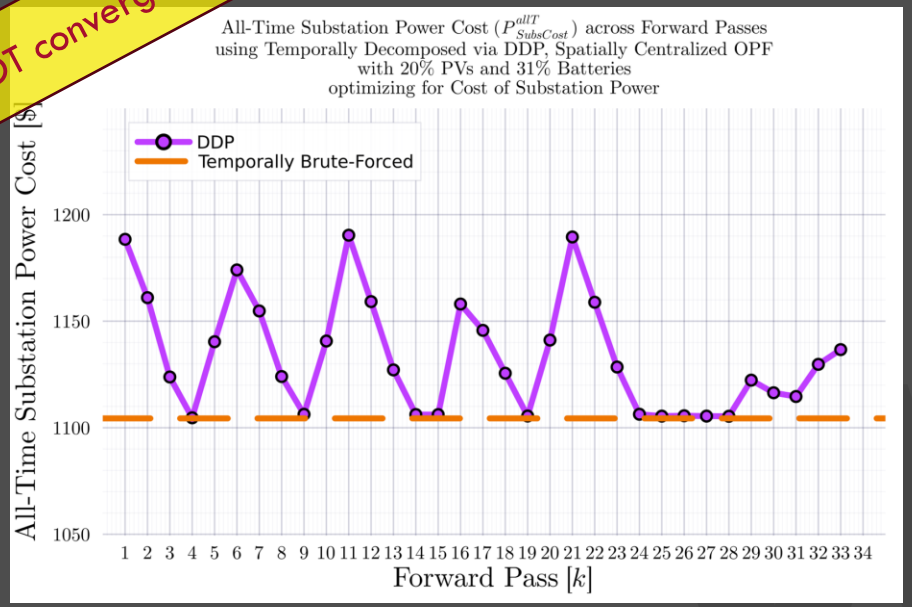
BruteForced (BF)

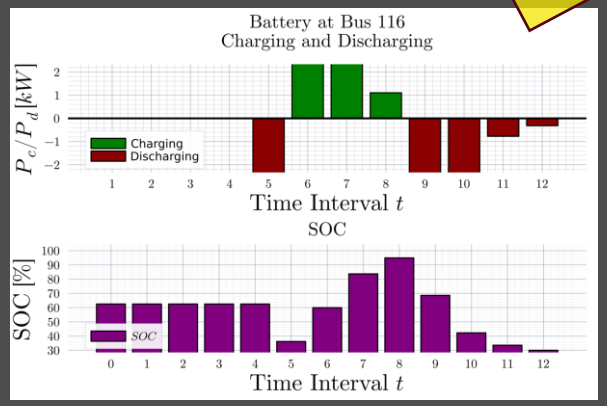


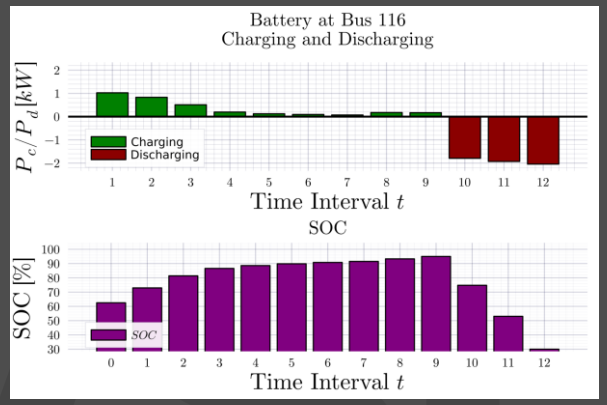




Will NOT converge







$k_{Max} = 33$

Even if not converging, it at least does 'hit' the optimal value periodically.

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