

Smart Energy Systems

Winter 2020-2021

Optimization Project Group

Final Presentation

The objective of the final presentation is to present your problem descriptions, implementations, and results in a concise manner.

Task Descriptions:

1. Consider that the microgrid is integrated with three charging stations, to which three electric vehicles (*EV*s) whose characteristics are described in Milestone 4 are integrated. Assume that each *EV* is plugged into a charging station at 30% state of charge (*SoC*) at the beginning of the eighth hour and needs to be at 60% *SoC* when it is plugged out at the end of the seventeenth hour. Suppose that, during the time period at electric vehicles are plugged in, the *SoC* of the *EV* batteries cannot go above 80% or below 20%.
 - (a) Present your updated problem description.
 - (b) Investigate the influence of the number of Monte Carlo samples generated using the Antithetic Variates (*AV*) technique by varying the number of samples from 10^2 to 10^5 on a base-10 log scale and fix the first-stage decisions obtained under each number of samples. Subsequently, generate 1000 new samples and compute the mean and the variance of the optimal cost with the fixed first-stage decisions associated with each number of samples.
 - (c) Repeat the previous item for crude Monte Carlo samples.
2. Explain the key thrusts of your L-shaped method implementation.
3. Map out the influence of the number of samples by using your previous milestone results as well as the results of Task 1.
4. Describe the influence of the variance reduction methods by drawing upon your previous milestone results as well as the results of Task 1.

5. Provide directions for future work.

Expected Outcome:

You are asked to

1. prepare a slide set depicting the work you carried out. The prepared slide set is to be presented in class on February 23, 2021; the duration of the presentation is 25 minutes.