Amin Asadi
University of Arkansas

Ph.D. candidate in **Industrial Engineering**

Research area and interests: **Operations research, Stochastic optimization, Data Analytics with applications in Transpiration, Energy, and Healthcare.**

Dissertation: Making optimal decisions under **uncertainty** for drone and EV swap stations

Mathematical Model: **Markov Decision Process**

Solution Methods and algorithms: **Dynamic Programming (DP), Approximate Dynamic Programming (ADP), heuristic algorithms**

I have two papers under revision so far. I developed my code using **C++.**

1) Focus on mathematical formulation and standard DP algorithm.

   - The main challenges are the curses of dimensionality.
   - I was able to provide solutions for **modest size** problem using **830GB** and 3.8h on Arkansas HPC. (Single node is used.)

2) Provide ADP algorithm to find near-optimal solutions for **large-scale** problem using the mathematical structure of the optimal policy of the modest size.

   - No memory issue (**Less than 20GB**)
   - 10hours computational time

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My objectives and hopes are:

1) Learning methods to overcome the curses of dimensionality and speed-up my codes, specially **multi-threading and parallelization**.

2) Learning techniques to efficiently use HPC and apply them using our HPC at U of A.

3) Improve my **scripting** skills.

4) Become familiar with new HPC like Comet.

5) Find knowledgeable and cool contacts who are able to answer my questions.

6) Find friends and potential collaborators in the future.

7) My hope is to be able to use SDSC computational resources in the future as an SDSC student.

8) Finally, along with the developed skills, my hope is to get some sort of certification (if you issue any) as I will be in the market this year.