

# American-Made Data-Driven Distributed (3D) Solar Visibility Prize

Team: Energy, Control, Optimization (ECOLab) at Stevens

# Data to Decisions: Deep Learning for Solar Energy

## Summary:

We plan to use Deep Learning, and either a discrete event simulation (e.g., Markov Chain) or Time Series Analysis depending on the data given, in order to predict state vectors.

### Discrete Event Simulation (e.g., Markov Chain)

- When Used: Applied when the data set contains event-driven sequences.
- How It Works: Used to model the probability of different states based on historical events.
- Benefits: Provides precise state transitions and is effective in scenarios with clear event sequences.

### Time Series Analysis

- When Used: Applied when the data set includes continuous time-based sequences.
- How It Works: Analyzes data points collected or recorded at specific time intervals to forecast future states.
- Benefits: Excellent for identifying trends, seasonal patterns, and making short-term predictions.

### Why Our Approach Stands Out

- Versatility: Ability to switch between discrete event simulation and time series analysis depending on the data type ensures robust and adaptable state estimation. From there, the DSSE algorithm will determine defects in the data, such as meter misreads and so forth.