

Hopping Window Mean Aggregation

This assignment demonstrates the application of a hopping window mean aggregation on time series data generated by a simulated sensor. The sensor generates readings every second, and to manage data throughput and reduce latency, a hopping window function is applied to calculate the average sensor reading over a sliding time frame.

Methodology

- 1. Data Generation:** The time series data consists of timestamps and sensor values. Each reading is generated randomly every hour for 100 periods.
- 2. Hopping Window Parameters:** The window size is set to 3 hours, and the hop interval is set to 1 hour. This configuration means that each window aggregates data over 3 hours and then hops forward by 1 hour for the next calculation.
- 3. Mean Calculation:** Using the rolling window approach, the mean value is computed for each 3-hour window. The results are stored in a new column representing the hopping mean.
- 4. Visualization:** The original sensor data and the calculated hopping mean are plotted to visually demonstrate the smoothing effect of the hopping window aggregation.

Results

The plot below shows the original sensor readings and the calculated hopping mean. The hopping mean provides a smoother representation of the data by averaging over each 3-hour window. This method helps in identifying trends and reducing the noise in real-time data streams.

