Of course! Let's break down the positioning algorithm step by step and visualize the input data and actions involved:

1. **Input Data:**

- You have GNSS raw measurements data, which typically includes:

- GPS time: The time when the measurements were taken.

- Satellite PRN (ID): Identification of satellites used in measurements.

- Satellite coordinates in ECEF (X, Y, Z): Positions of satellites in Earth-Centered, Earth-Fixed coordinates.

- Pseudo-Range: Calculated distances from your receiver to satellites.

- CN0 (Carrier-to-Noise Ratio): Signal quality indicator.

- Doppler (optional): Frequency shift in satellite signals.

![GNSS Raw Measurements](https://i.ibb.co/2cY1bHh/GNSS-Raw-Measurements.png)

2. **Algorithm Steps:**

- **Step 1: Data Preparation:**

- Select a subset of satellites (SatPRNs) from the raw measurements based on criteria such as signal quality, geometry, etc.

- Use the selected satellite data (PRNs, coordinates, pseudo-ranges) as input for the algorithm.

- **Step 2: Iterative Positioning Algorithm:**

- Start with an initial estimate of your position coordinates (X, Y, Z).

- Compute the pseudo-ranges from your estimated position to the selected satellites.

- Compare the computed pseudo-ranges with the observed pseudo-ranges from the raw measurements.

- Adjust your estimated position iteratively to minimize the RMS error between computed and observed pseudo-ranges.

- Use techniques like least squares optimization or convex optimization for iterative adjustments.

- Repeat the adjustment process until the RMS error is minimized or converges to a satisfactory level.

![Iterative Positioning Algorithm](https://i.ibb.co/98bchCn/Iterative-Positioning-Algorithm.png)

3. **Output:**

- The output of the algorithm is the calculated position coordinates (X, Y, Z) that best match the observed pseudo-ranges from the selected satellites.

- The algorithm aims to minimize the Root Mean Square (RMS) error, indicating the accuracy of the estimated position compared to the observed pseudo-ranges.

4. **Visualization:**

- You can visualize the computed position coordinates along with the selected satellites in 3D space using tools like matplotlib or 3D plotting libraries.

- Plotting the observed and computed pseudo-ranges can help visualize the convergence of the algorithm and the reduction in RMS error over iterations.

![Visualization](https://i.ibb.co/6g2NF3q/Visualization.png)

In summary, the positioning algorithm takes GNSS raw measurements as input, selects a subset of satellites, and iteratively adjusts your estimated position coordinates to minimize the RMS error between computed and observed pseudo-ranges. Visualization of the process can aid in understanding the algorithm's convergence and accuracy improvements over iterations.