

In the context of an Autoregressive (AR) model, *white noise* refers to a sequence of random variables (errors or shocks) with specific properties that make it ideal for modeling the unpredictable part of the data after accounting for autoregressive effects.

In detail, white noise in AR modeling typically means:

1. **Zero Mean:** The white noise has an average value (mean) of zero, meaning it oscillates around zero without any long-term trend.
2. **Constant Variance:** The white noise series has a constant variance, showing that it fluctuates around the mean with a fixed level of volatility.
3. **No Autocorrelation:** White noise errors are uncorrelated over time, which means that the value at any given time has no predictable relationship with past or future values. This is essential because any autocorrelation would imply that there is some underlying structure not captured by the AR model itself.

In AR models, white noise represents the *unexplained part of the time series*—the random, unpredictable components after accounting for the patterns captured by the AR component. If the model is well-specified, the residuals (errors) should ideally resemble white noise.