

The diagram illustrates the decomposition of a signal $Y(t)$ into a linear component X and a non-linear component $E(t)$.

On the left, the signal $Y(t)$ is shown as a vertical vector containing two waveforms: a green one at the top and a blue one at the bottom.

This is equal to the linear component X , which is a vertical vector with ones at the top and bottom and dots in between. To the right of X , the input values are specified as $x_1=1$ (top) and $x_N=0$ (bottom).

The linear component X is added to a non-linear component, represented by a vertical vector containing a black waveform at the top and a red curve at the bottom. The black waveform is labeled $\beta_0(t)$ and the red curve is labeled $\beta_1(t)$. A horizontal double-headed arrow below this vector is labeled $\beta(t)$.

Finally, the non-linear component is added to the linear component X to produce the residual signal $E(t)$, shown on the right as a vertical vector with a green waveform at the top and a blue waveform at the bottom.

$$Y(t) = X + \begin{bmatrix} \beta_0(t) \\ \beta_1(t) \end{bmatrix} + E(t)$$