

Cubic vs. Natural vs. Smoothing Splines

Criterion	Polynomial Splines	Natural Splines	Smoothing Splines
Flexibility	High with more knots	Moderate	High, controlled by λ
Boundary Behavior	May behave erratically	Linear at boundaries	Smooth, but depends on λ
Noise Handling	Poor, sensitive to noise	Moderate	Excellent, balances fit and smoothness
Interpretability	Good for low degree	Good	Moderate, influenced by λ
Knot Selection	User-defined	User-defined	Not required
Computation	Fast	Fast	Slower for large data

Generalized Additive Models (GAMs)