Questions and answers

How do I convert the equation from nonlinear to linear?

If you allow substitution of variables, however, there are possibilites. As one other answer noted, a polynomial function of degree 2 with no linear term can be made to have the form of a linear equation by substituting $X = x^2$. Then $y = ax^2 + c$ becomes $y = aX + c$. There are other limited possibilities for polynomial functions that factor into appropriate forms.

Using log substitutions can convert exponential functions and power functions to linear form. If we begin with $y = a^x$, then take the natural log of both sides, we get $ln(y) = xln(a)$. Making the substitution $Y = ln(y)$, we get $Y = xln(a)$, a linear function with slope $ln(a)$.

If we begin with $y = x^a$, take the natural log of both sides, yielding $ln(y) = aln(x)$. The substitutions $Y = ln(y)$ and $X = ln(x)$ gives us $Y = aX$, a linear function.

And

A nonlinear differential equation can be converted in the form of Bernoulli's equation into a linear differential equation A nonlinear differential equation can be converted in the form of Bernoulli's equation into a linear differential equation

Which models of machine learning have nonlinear equations?

Multivariate linear regression

$h_\theta(x) = \theta^T x$

logistic regression

$h_\theta(x) = g\ (\theta^T x) = 1/1 + e^{-\theta^T x}$

ANN

$h_\theta(x) = 1/1 + e^{-\theta^T x}$

SVM