Generalized Boosted Models: A guide to the gbm package

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1 Available distributions

For non-zero offset terms, replace all $f(\mathbf{x}_i)$ with $o_i + f(\mathbf{x}_i)$

1.1 Gaussian

Loss function	$\frac{1}{\sum w_i}\sum_{i=1}^{N} w_i(y_i - f(\mathbf{x}_i))^2$
Initial value	$f(\mathbf{x}) = \frac{\sum y_i - o_i}{\sum w_i}$
Gradient	$z_i = y_i - f(\mathbf{x}_i)$
Terminal node estimates	$\frac{\sum w_i(y_i - f(\mathbf{x}_i))}{\sum w_i}$

1.2 AdaBoost

Loss function	
Gradient	$z_i =$
Terminal node estimates	

1.3 Bernoulli

Loss function	
Gradient	$z_i =$
Terminal node estimates	

1.4 Laplace

Loss function	
Gradient	$z_i =$
Terminal node estimates	

1.5 Cox Proportional Hazard

Loss function	
Gradient	$z_i =$
Terminal node estimates	

1.6 Poisson

Loss function	$-2\frac{1}{\sum w_i}\sum w_i(y_i f(\mathbf{x}_i) - \exp(f(\mathbf{x}_i)))$
Initial value	$f(\mathbf{x}) = \log\left(\frac{\sum w_i y_i}{\sum w_i e^{o_i}}\right)$
Gradient	$z_i = y_i - \exp(f(\mathbf{x}_i))$
Terminal node estimates	$\frac{\sum w_i y_i}{\sum w_i \exp \mathbf{x}_i}$

1.7

Loss function	
Gradient	$z_i =$
Terminal node estimates	