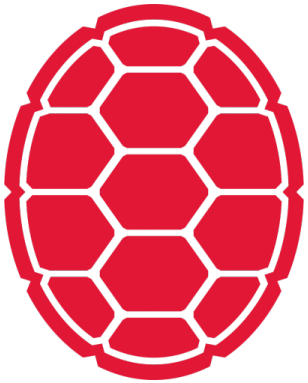

Boosting: Gradient Regression

Machine Learning: Jordan Boyd-Graber
University of Maryland
SLIDES ADAPTED FROM CHENG LI

Intuition: Regression Problem

Problem Setup

Let's say you're given $(x_1, y_1), (x_2, y_2) \ldots$: you're given an "okay" model F. How do you improve?

1. Can't change F
2. Can only propose "delta" function $h(x)$

Intuition: Regression Problem

Problem Setup

Let's say you're given $(x_1, y_1), (x_2, y_2) \ldots$: you're given an "okay" model F. How do you improve?

1. Can't change F
2. Can only propose "delta" function $h(x)$
3. $F(x_n) + h(x_n) \Rightarrow h(x_n) = y_n - F(x_n)$

This looks like regression

- Fit regression tree to

$$
\begin{aligned}
cc x_1 y_1 - F(x_1) &\quad (1)\\
x_2 y_2 - F(x_2) &\quad (2)\\
\vdots &\quad (3)\\
x_n y_n - F(x_n) &\quad (4)
\end{aligned}
$$

- You're fitting to residuals to try to reduce error further!

How does this connect to gradient?