

# Prediction in the linear model

stats545.3 545.3 Hypothesis tests in the linear model, model building  
and predictions

Gunnar Stefansson

November 28, 2020

# Prediction and prediction uncertainty

A new observation:  $\mathbf{x}_h$

The prediction:  $\hat{y}_h = E[\hat{y}_h] = \mathbf{x}_h' \hat{\boldsymbol{\beta}}$

The variance:  $\sigma^2 \mathbf{x}_h' (\mathbf{X}'\mathbf{X})^{-1} \mathbf{x}_h$

Prediction uncertainty:  $V[y_h - \hat{y}_h]$

**Copyright** 2020, Gunnar Stefansson

This work is licensed under the Creative Commons Attribution-ShareAlike License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-sa/1.0/> or send a letter to Creative Commons, 559 Nathan Abbott Way, Stanford, California 94305, USA.