Machine Learning

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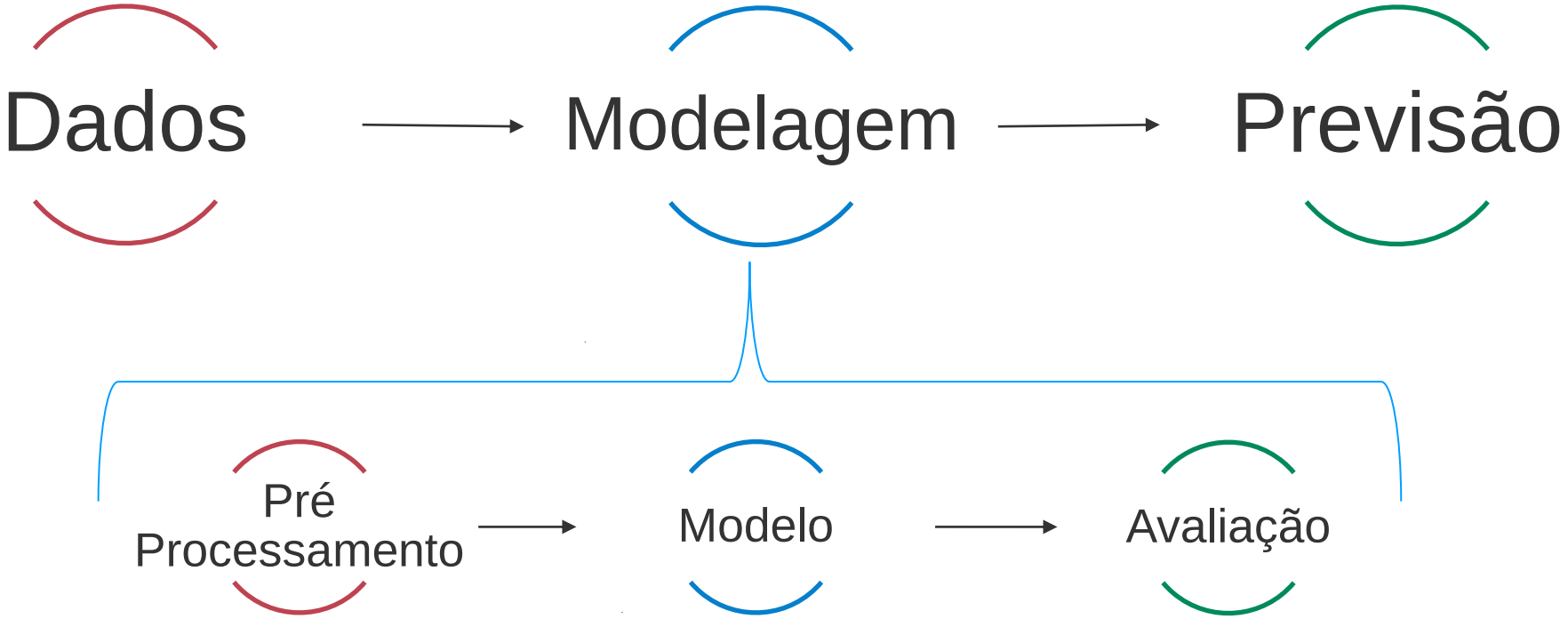
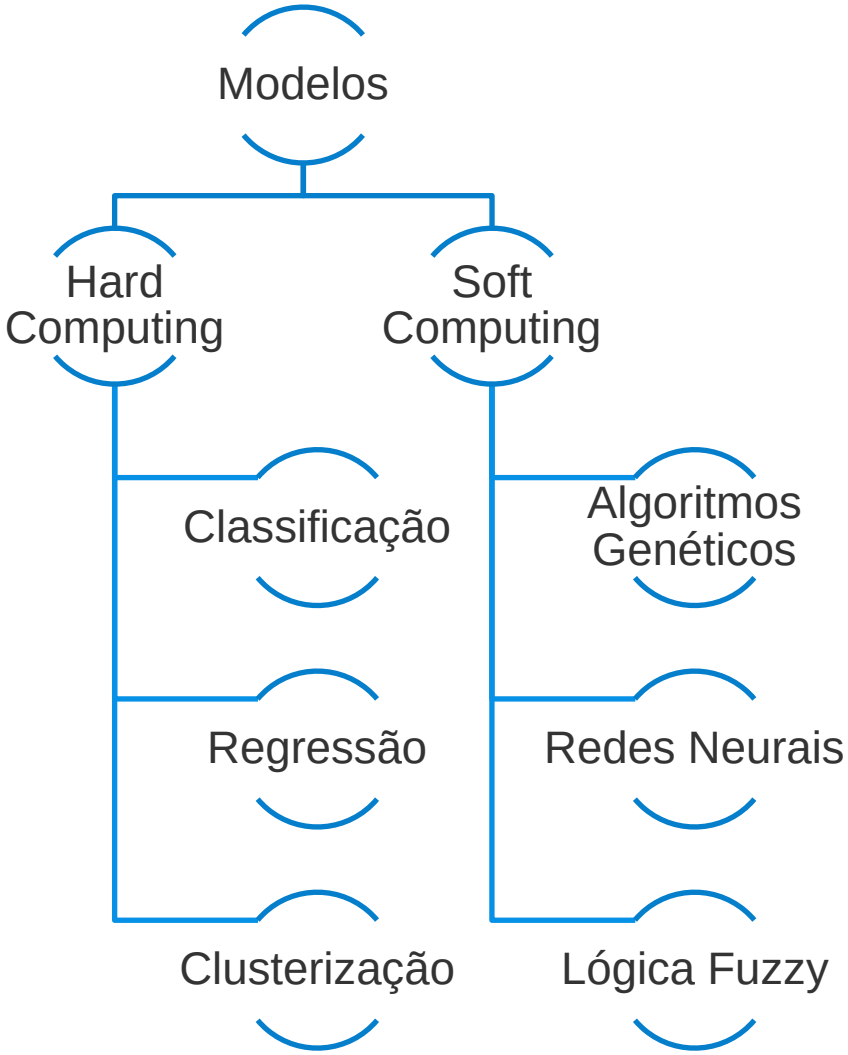


Categorias



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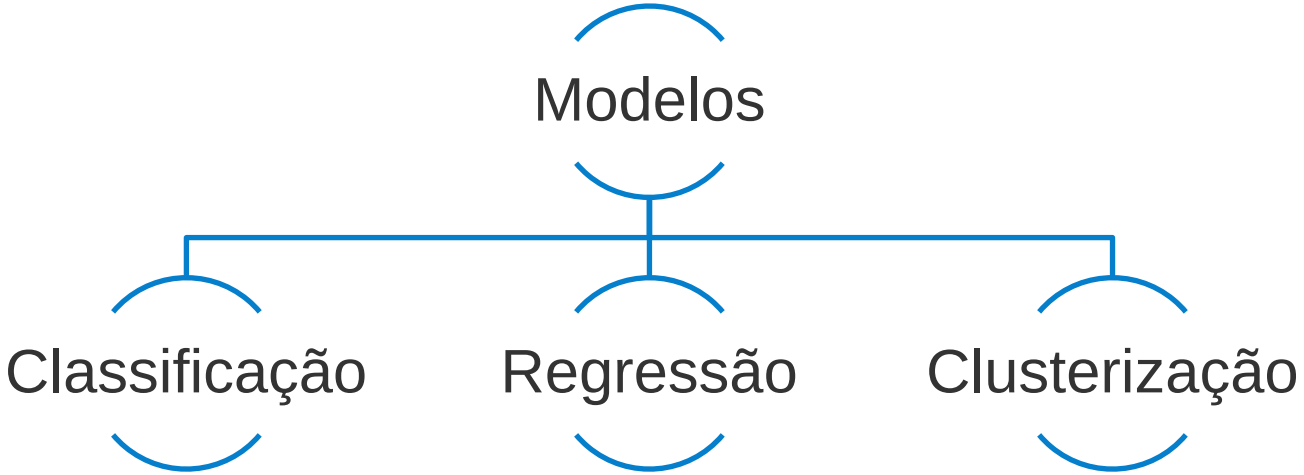
Machine Learning (Tradicional)



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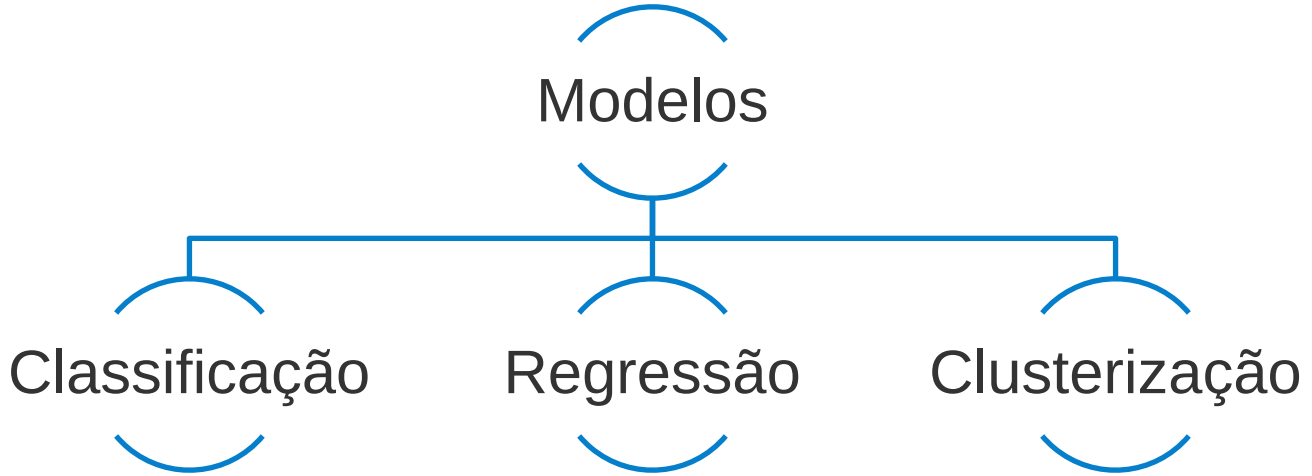
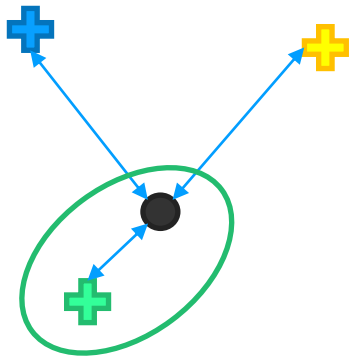
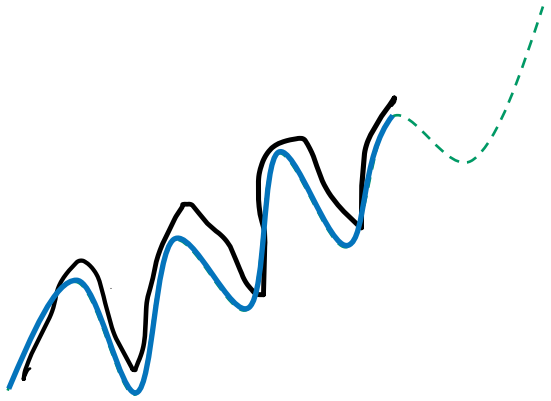
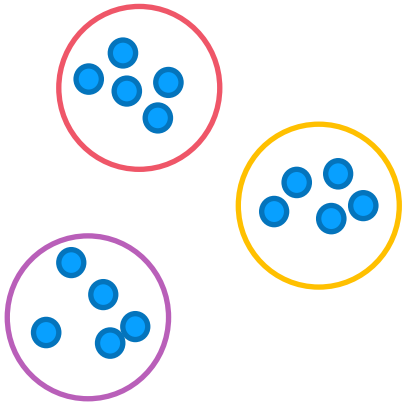
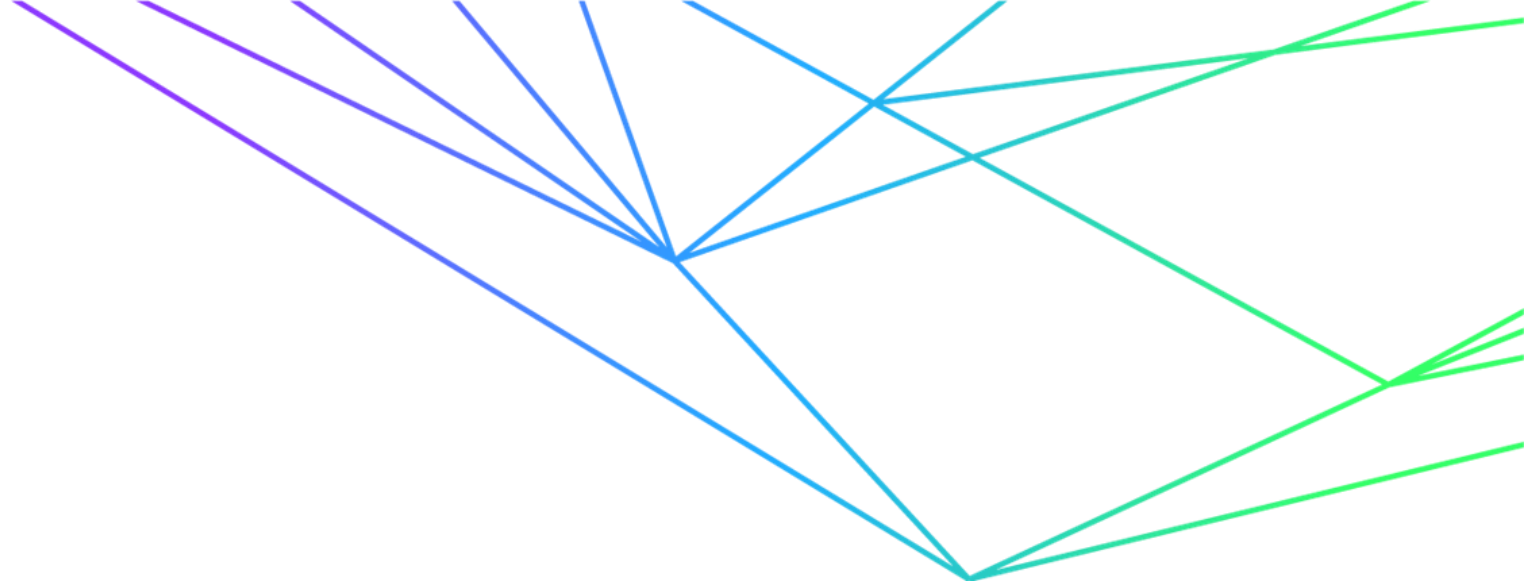










Regressão

Prevendo Valores “Contínuos”

Regressão

Métodos

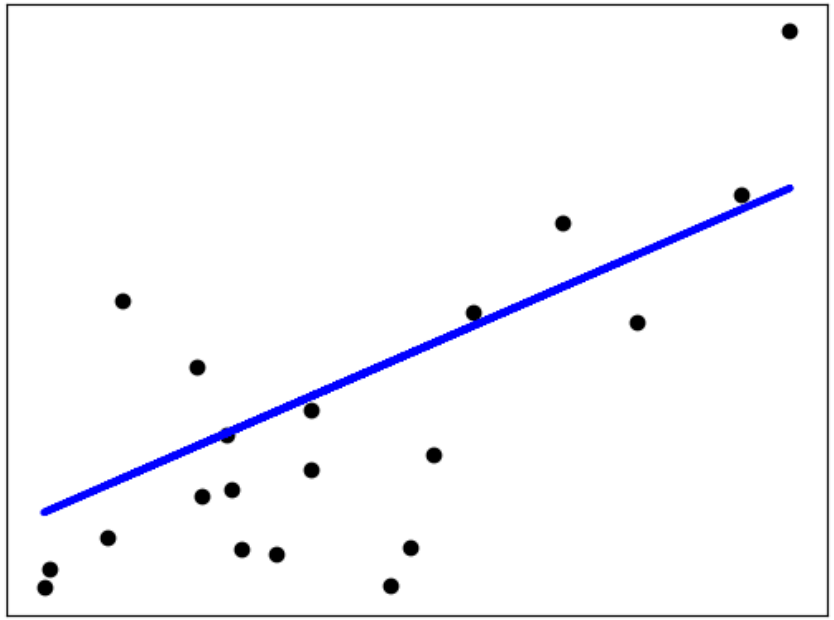
- Regressão Linear
- Regressão Polinomial
- Ridge Regression
- Lasso Regression
- Stepwise Regression
- Regressão Linear Bayesiana

Fonte: https://www.analyticsvidhya.com/blog/2015/08/comprehensive-guide-regression/
https://www.upgrad.com/blog/types-of-regression-models-in-machine-learning/

Regressão Linear

y=mx+c

Encontrar a reta que melhor descreve os dados.

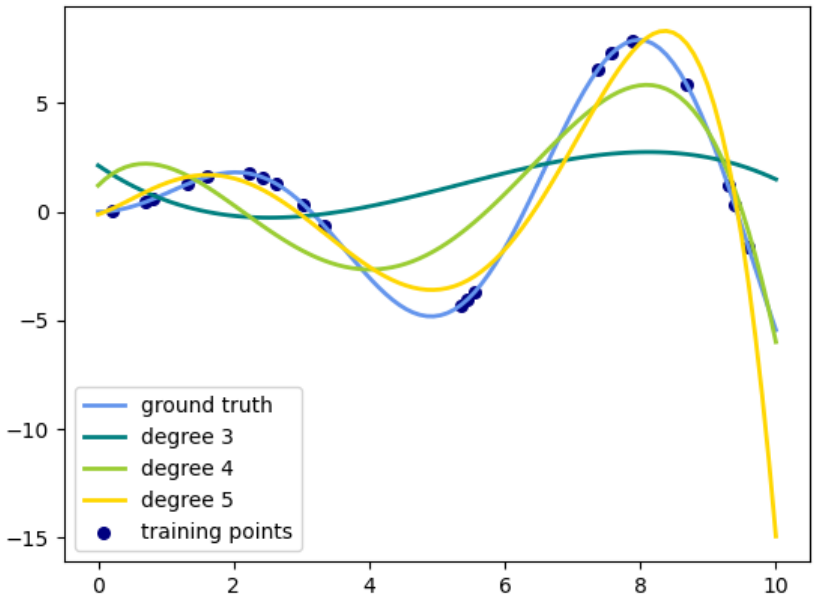


Fonte: https://scikit-learn.org/stable/auto_examples/linear_model/plot_ols.html#sphx-glr-auto-examples-linear-model-plot-ols-py

Regressão Polinomial

Encontrando os coeficientes de um polinômio

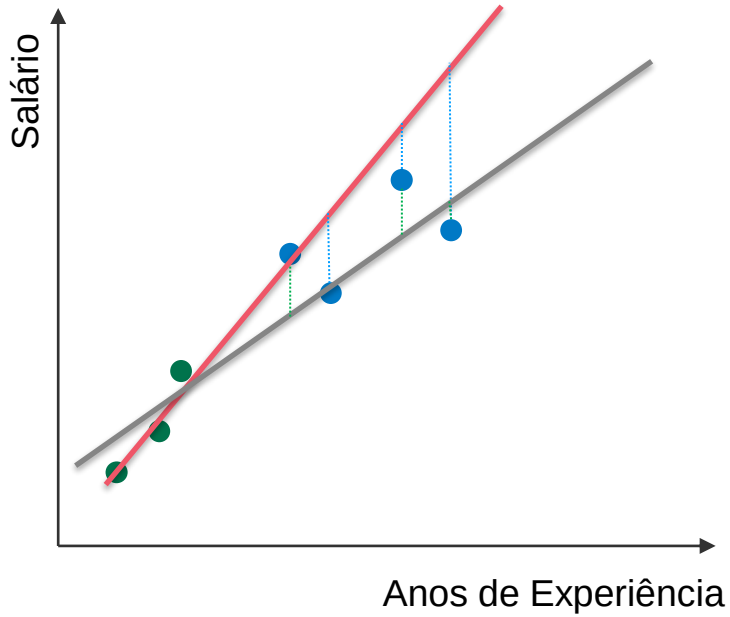
$$\hat{y}(w, x) = w_0 + w_1 x_1 + w_2 x_2 + w_3 x_1 x_2 + w_4 x_1^2 + w_5 x_2^2$$



Fonte: https://scikit-learn.org/stable/modules/linear_model.html

Ridge Regression

Aborda alguns dos problemas dos Mínimos Quadrados Ordinários, impondo uma penalidade



Mínimos Quadrados

$$\min\left(\sum soma\ dos\ residos\ ao\ quadrado\right)$$

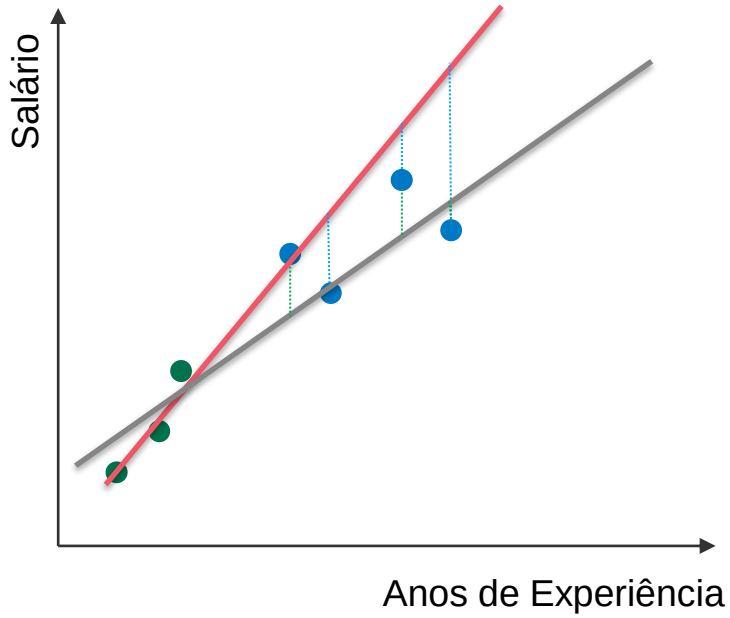
Ridge Regression

$$\min\left(\sum soma\ dos\ residos\ ao\ quadrado + \propto * inclinação^2\right)$$

Fonte: https://www.youtube.com/watch?v=OEU22e20tWw

Lasso Regression

Bem similar a Ridge Regression mas tem a vantagem de conseguir zerar a inclinação



Mínimos Quadrados

$$\min\left(\sum soma\ dos\ residos\ ao\ quadrado\right)$$

Ridge Regression

$$\min\left(\sum soma\ dos\ residos\ ao\ quadrado + \propto * inclinação^2\right)$$

Lasso Regression

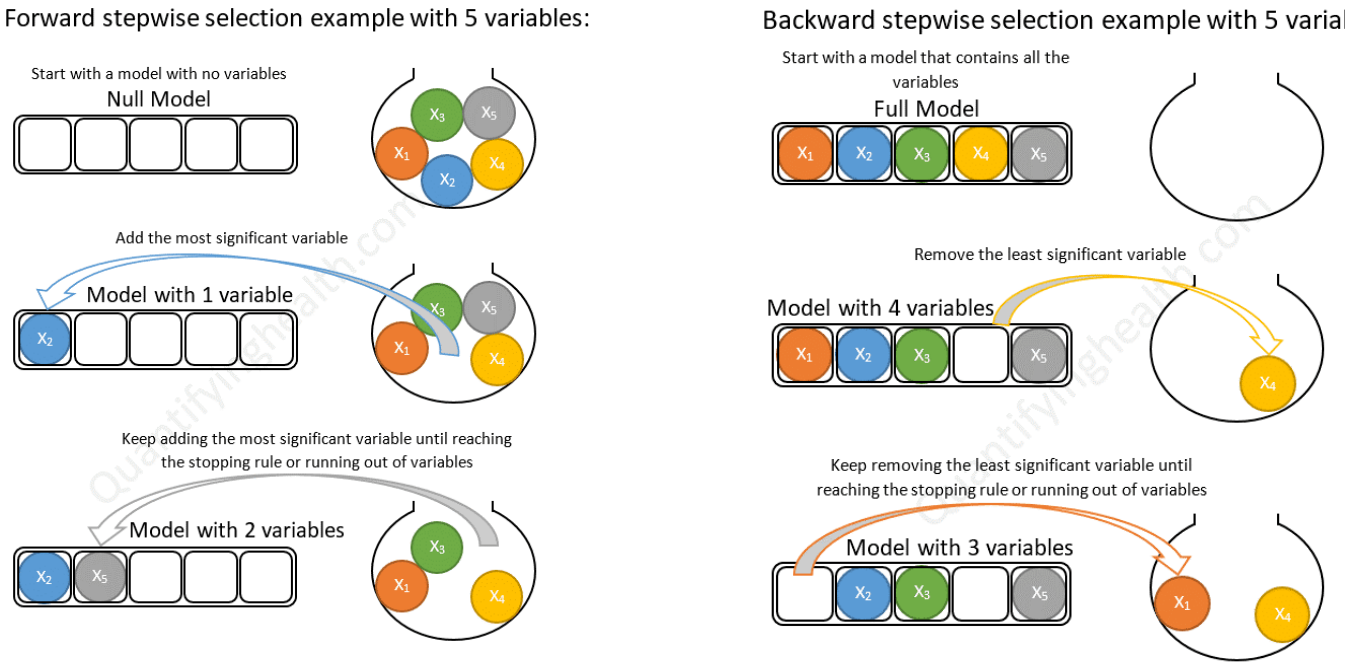
$$\min\left(\sum soma\ dos\ residos\ ao\ quadrado + \propto * |inclinação|\right)$$

Fonte: https://www.youtube.com/watch?v=OEU22e20tWw

Stepwise Regression

Selecionando variáveis dependentes

A Stepwise Regression é a construção iterativa passo a passo de um modelo de regressão que envolve a seleção de variáveis independentes a serem usadas em um modelo final



Fonte: https://quantifyinghealth.com/stepwise-selection/

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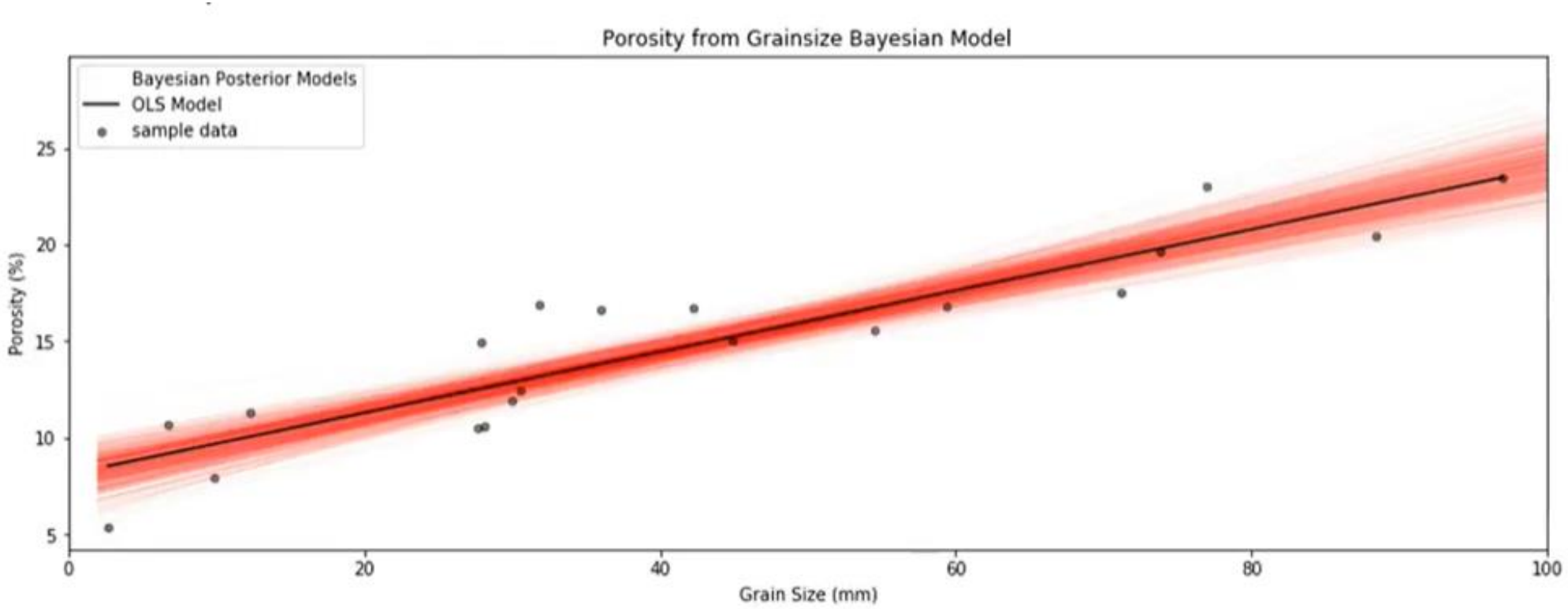
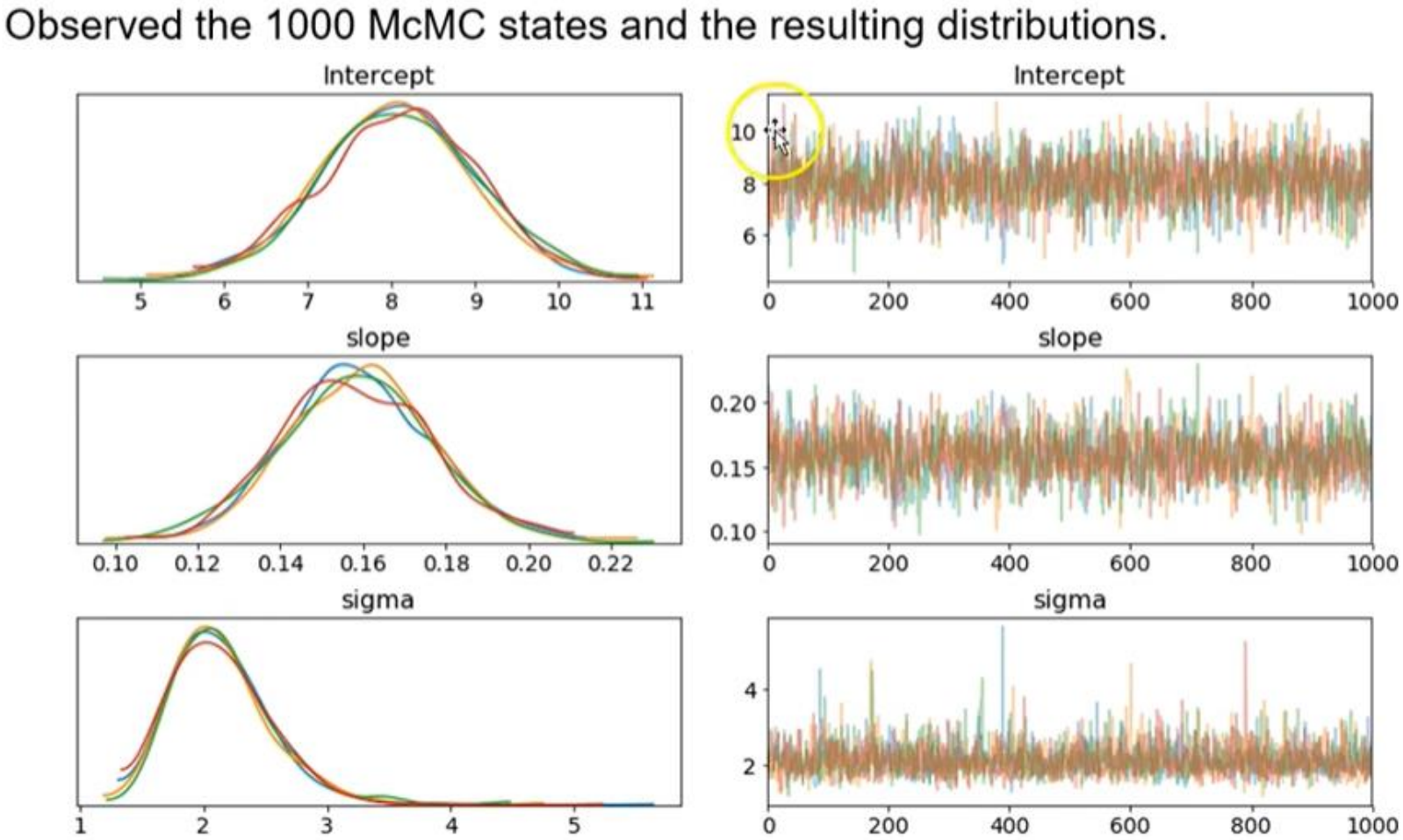
Regressão Linear Bayesiana

Adicionando a incerteza



Fonte: https://www.youtube.com/watch?v=JG69fxKzwt8

Regressão Linear Bayesiana



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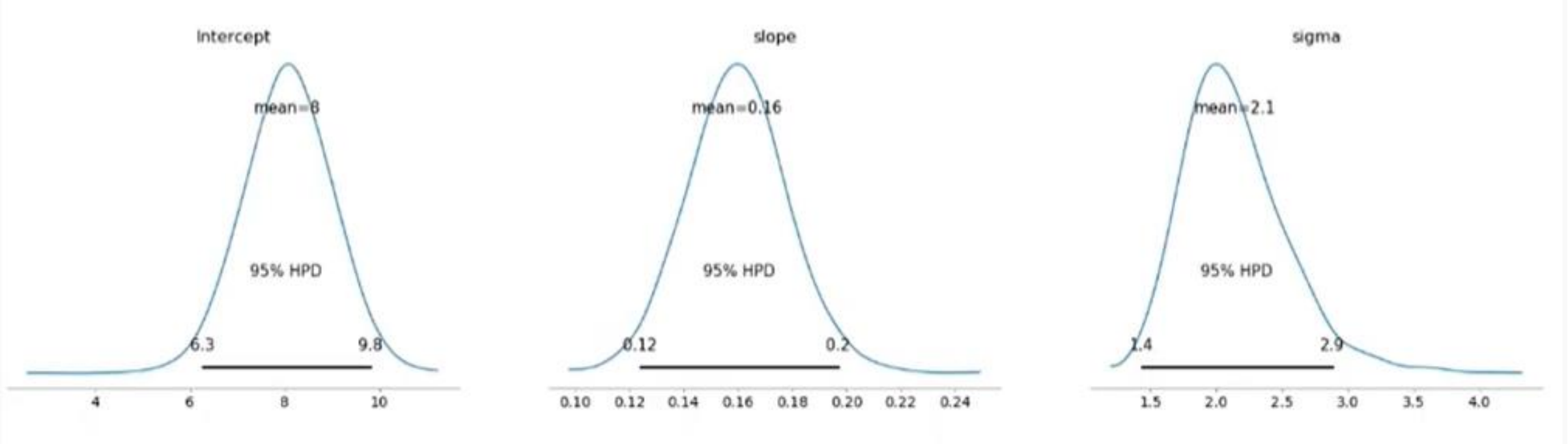
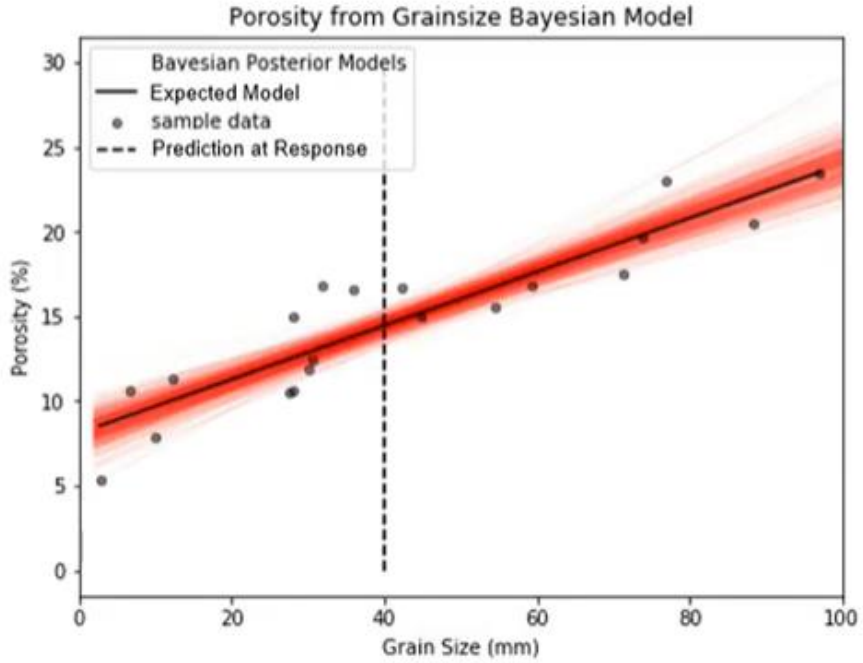
Regressão Linear Bayesiana

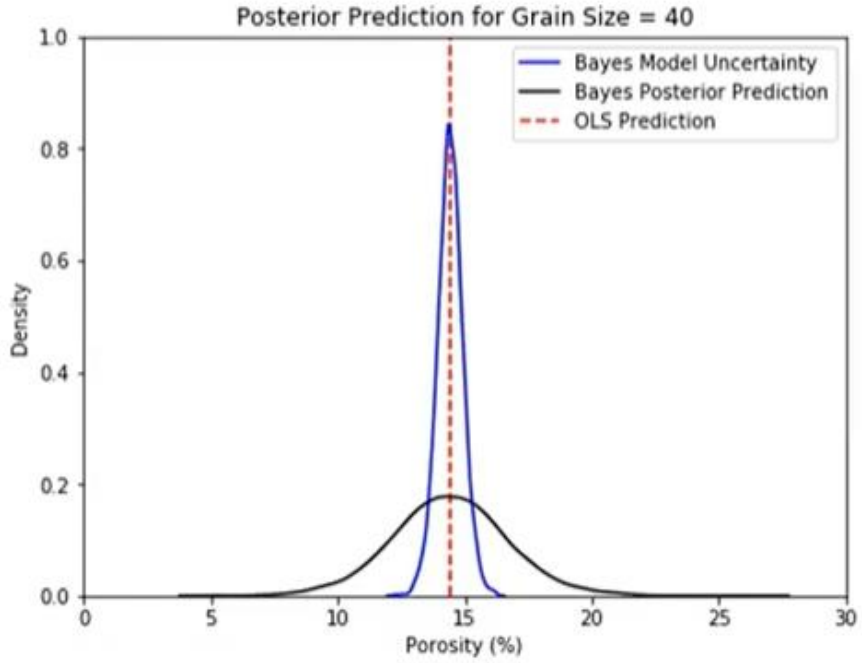


Fonte: https://www.youtube.com/watch?v=JG69fxKzwt8

Regressão Linear Bayesiana

For a given grain size, prediction of porosity with uncertainty





We require uncertainty in the model parameters + uncertainty given the model, σ^2, homoscedastic variance.

Fonte: https://www.youtube.com/watch?v=JG69fxKzwt8