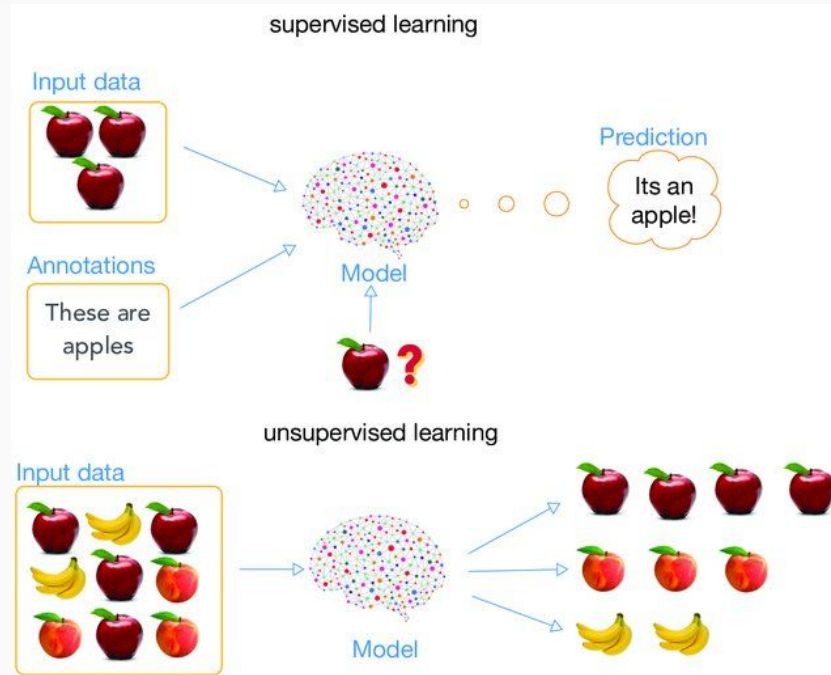


# Dia 2 - Curso de IA e Mapeamento Preditivo

Aprendizado supervisionado e mapeamento de potencial mineral

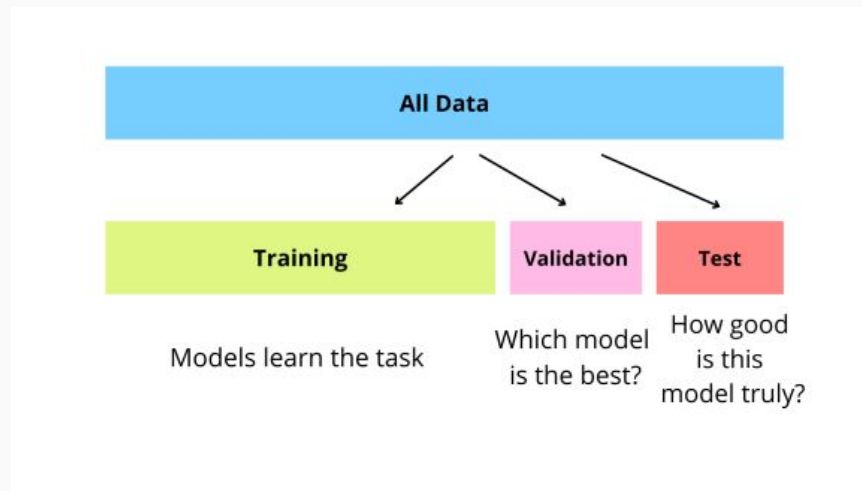
Victor S. dos Santos

# Métodos de machine learning



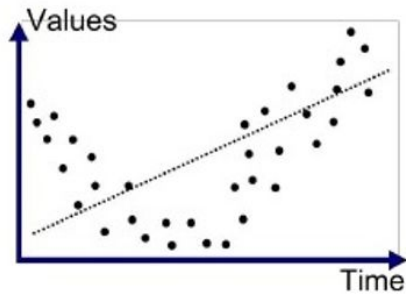
fonte: Ma, Y.; Liu, K.; Guan, Z.; Xu, X.; Qian, X.; Bao, H. Background Augmentation Generative Adversarial Networks (BAGANs): Effective Data Generation Based on GAN-Augmented 3D Synthesizing. *Symmetry* **2018**, *10*, 734.

# Conjuntos de treino, validação e teste

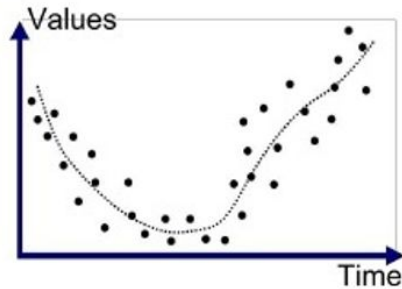


fonte: Galaxy Inferno

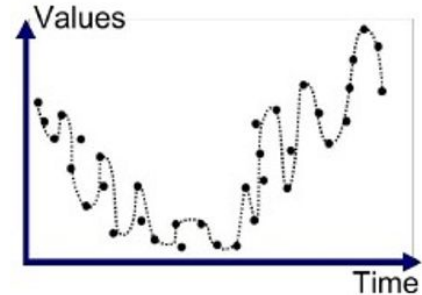
# Overfitting



Underfitted



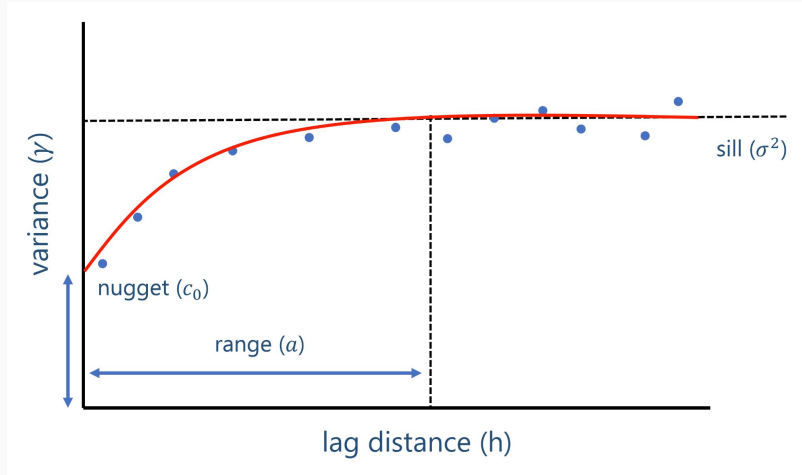
Good Fit/Robust



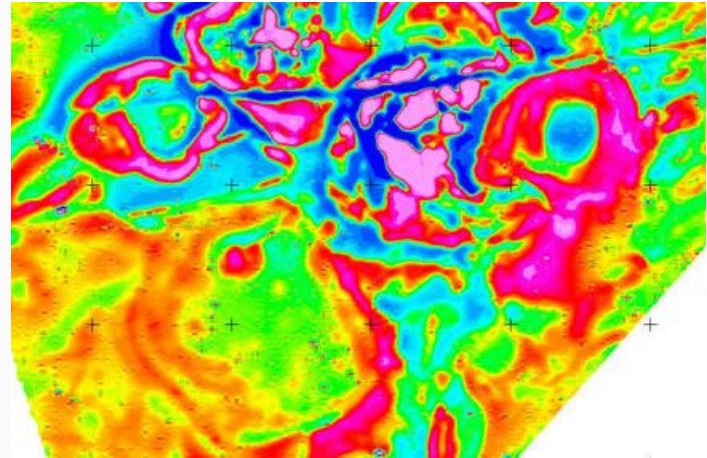
Overfitted

fonte: medium

# Autocorrelação espacial

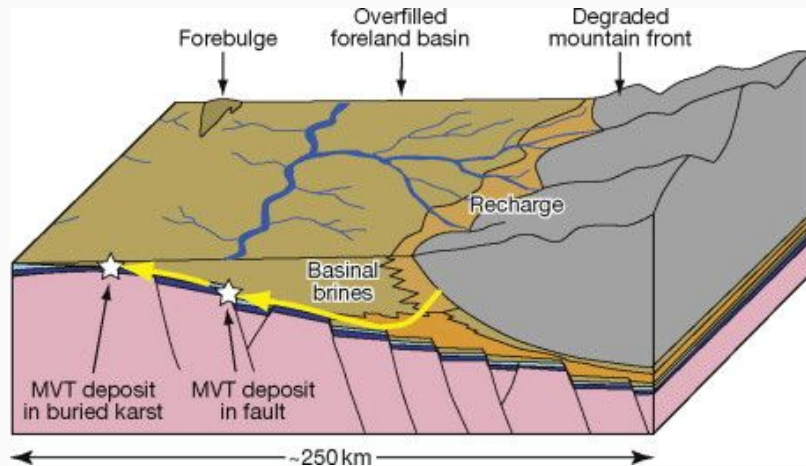


fonte: Pythonic Excursions



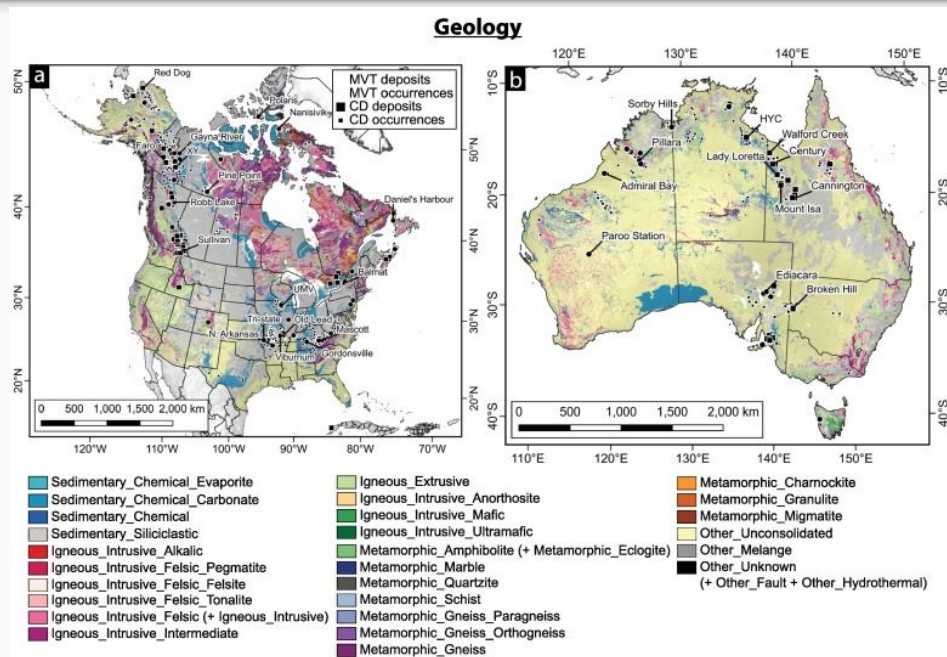
fonte: USGS

# Depósitos Mississippi-Valley (Zn-Pb)



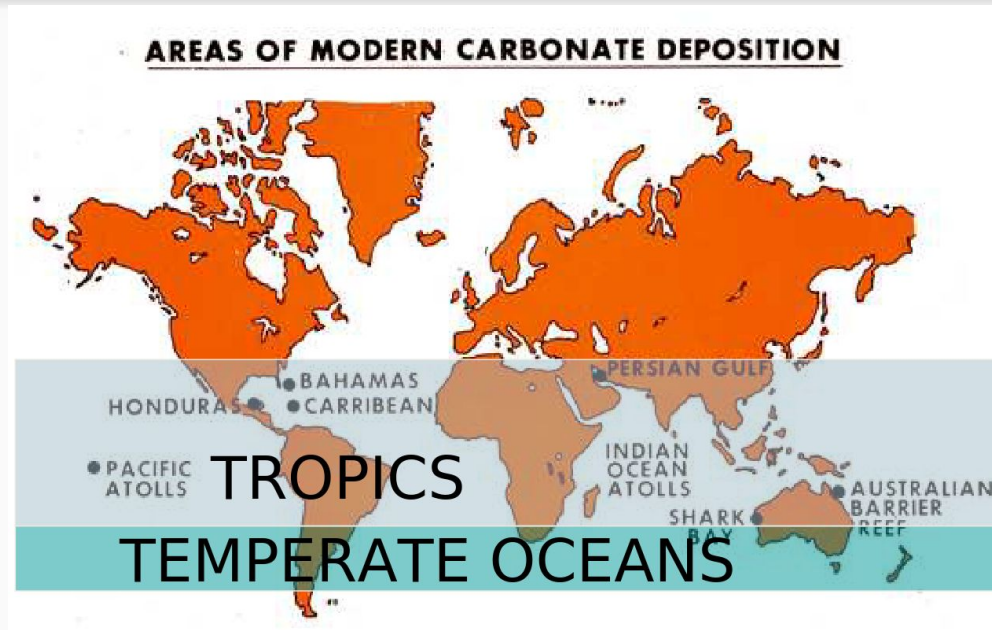
fonte: sciencedirect

# Geologia - correlação litologia vs ocorrências



fonte: <https://doi.org/10.1016/j.oregeorev.2021.104635>

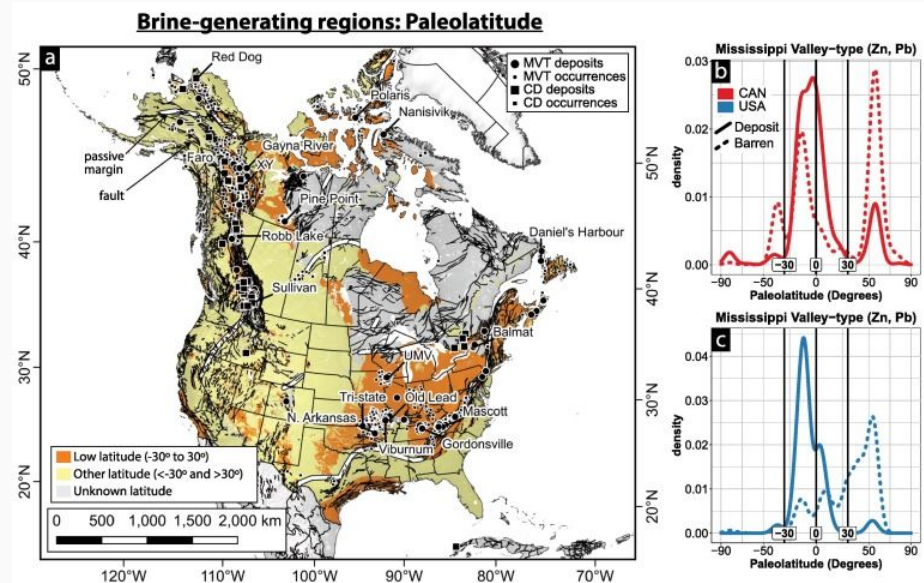
# Plataformas carbonáticas



fonte: GSA 0621 – Princípios de Geologia Sedimentar

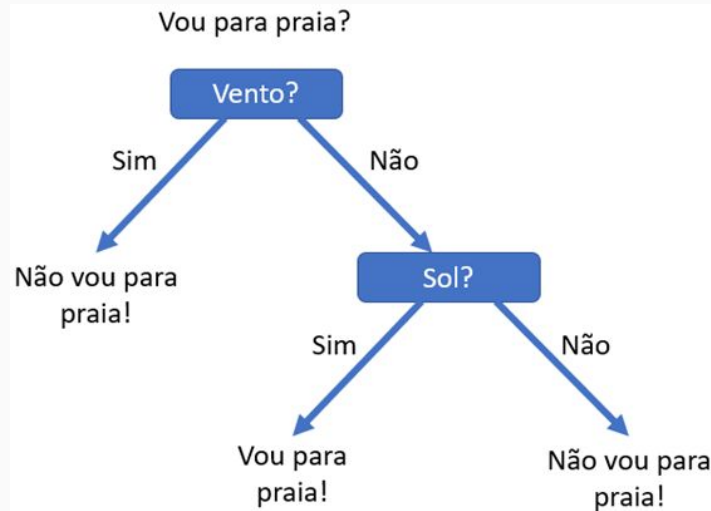


# Paleo-salmouras - Canada & US



fonte: <https://doi.org/10.1016/j.oregeorev.2021.104635>

# Árvores de decisão



fonte: Didática Tech

# Random forest - Bagging - pontos

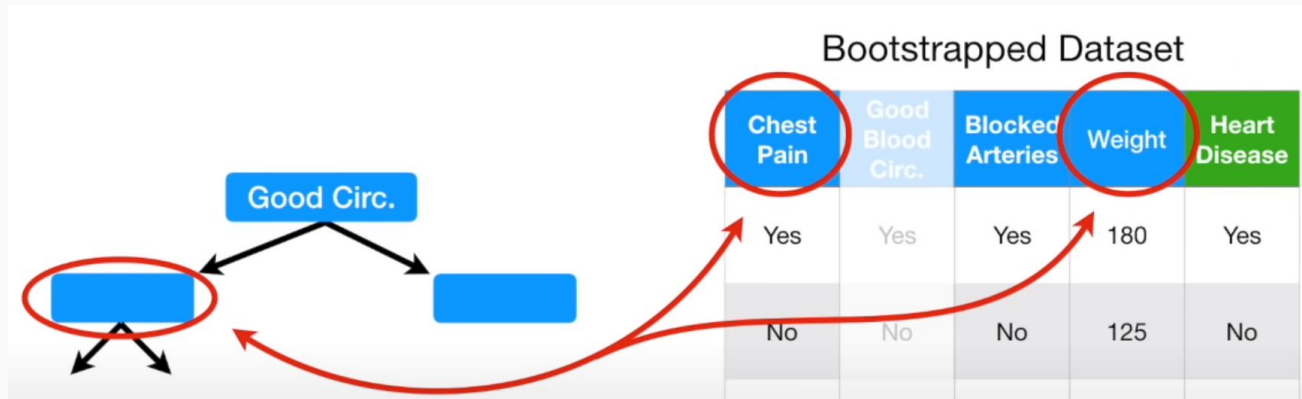
Original Dataset

Chest Pain	Good Blood Circ.	Blocked Arteries	Weight	Heart Disease
No	No	No	125	No
Yes	Yes	Yes	180	Yes
Yes	Yes	No	210	No
Yes	No	Yes	167	Yes

Bootstrapped Dataset

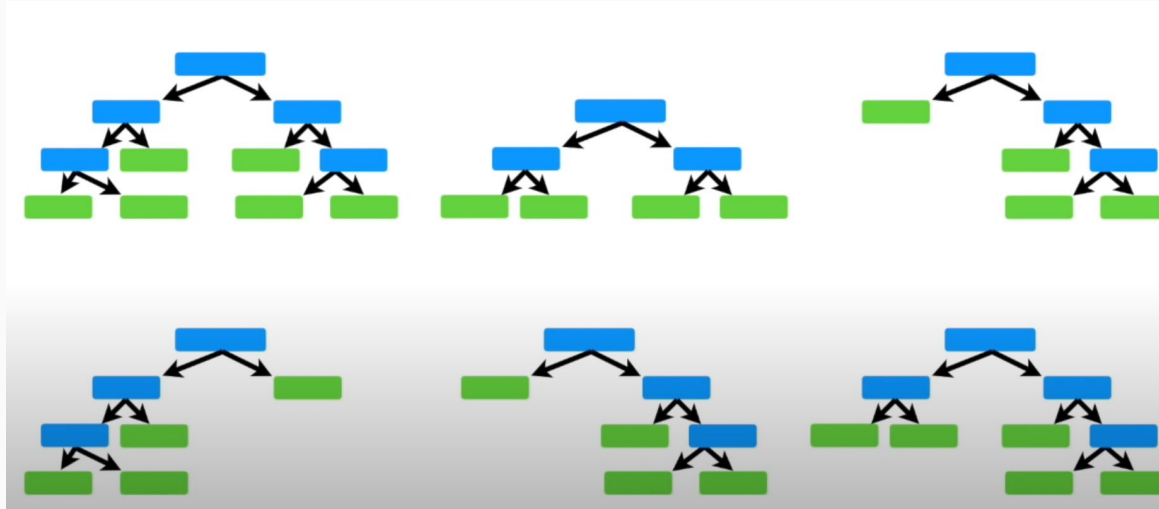
Chest Pain	Good Blood Circ.	Blocked Arteries	Weight	Heart Disease
Yes	Yes	Yes	180	Yes
No	No	No	125	No
Yes	No	Yes	167	Yes
Yes	No	Yes	167	Yes

# Random forest - Bagging - variáveis



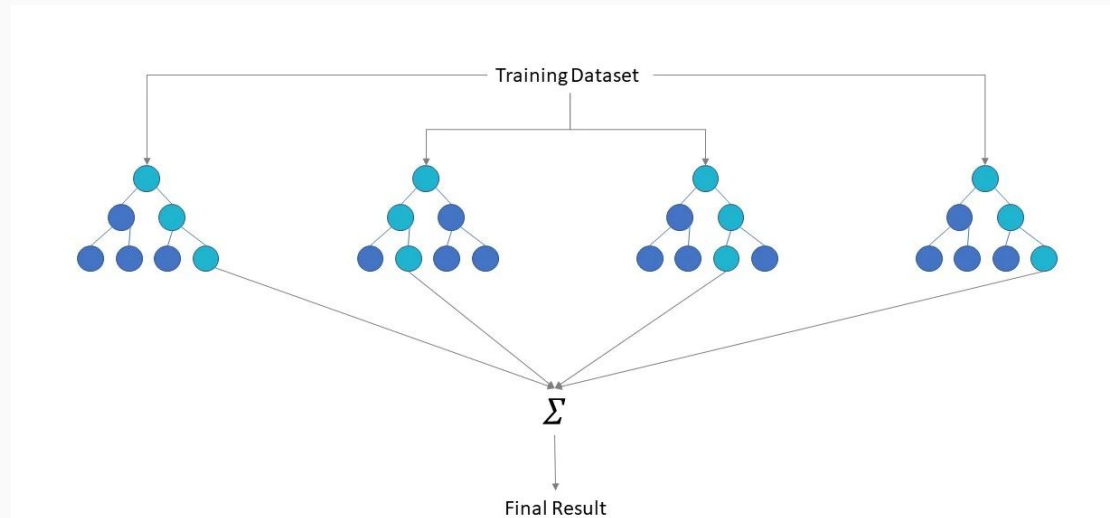
fonte: StatQuest - [https://www.youtube.com/watch?v=J4Wdy0Wc\\_xQ](https://www.youtube.com/watch?v=J4Wdy0Wc_xQ)

# Random forest - Múltiplas árvores



fonte: StatQuest - [https://www.youtube.com/watch?v=J4Wdy0Wc\\_xQ](https://www.youtube.com/watch?v=J4Wdy0Wc_xQ)

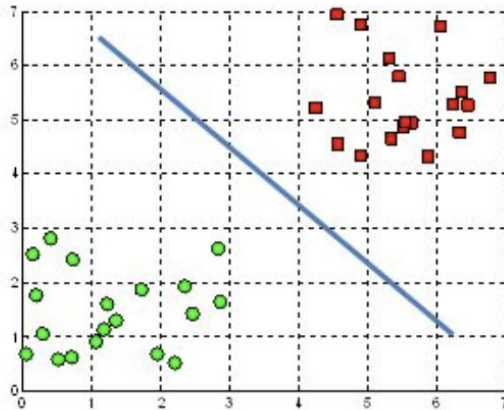
# Random forest - Voto majoritário



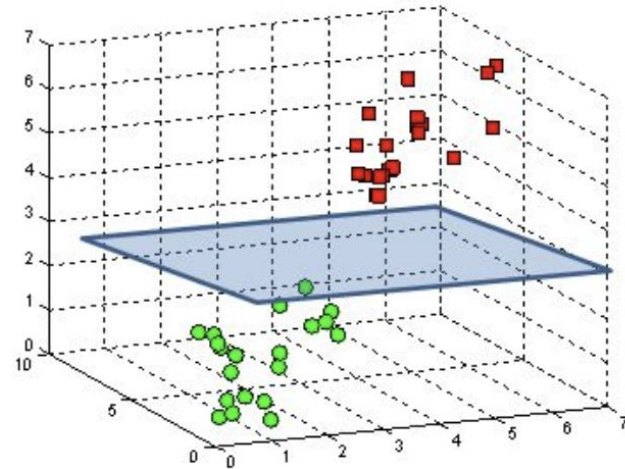
fonte: IBM

# Support Vector Machine (SVM) - Hiperplanos

A hyperplane in  $\mathbb{R}^2$  is a line



A hyperplane in  $\mathbb{R}^3$  is a plane



# Support Vector Machines (SVM) - Margem

