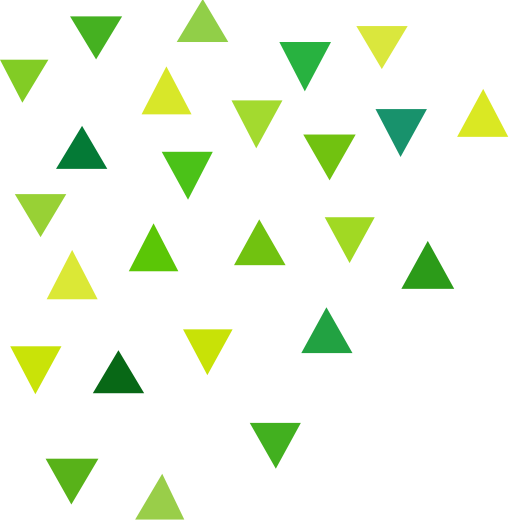
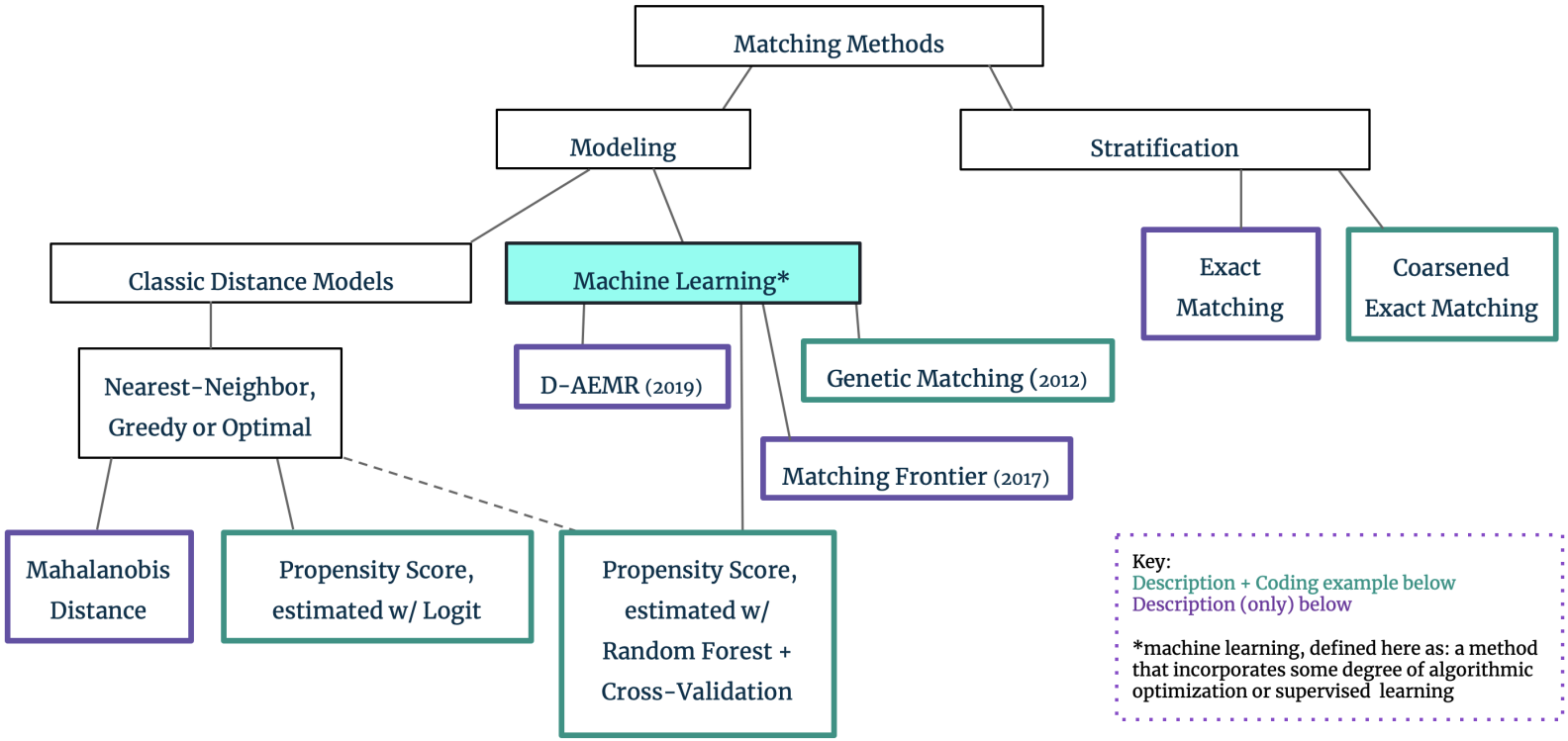


Cannlytics

Cannabis Data Science #128

September 27th, 2023

Matching Models



Authors: Samantha Sizemore and Raiber Alkurdi

Matching Methods For Causal Inference: A Machine Learning Update

https://humboldt-wi.github.io/blog/research/applied_predictive_modeling_19/matching_methods/

The History of Nearest Neighbor Search

- **Literate Programming**

  *"Instead of imagining that our main task is to instruct a computer what to do, let us concentrate rather on explaining to **human beings** what we want a computer to do."*

  - Donald Knuth

- **Analysis of algorithms**

  The study of the complexity of algorithms.

- Creator of the TEX!

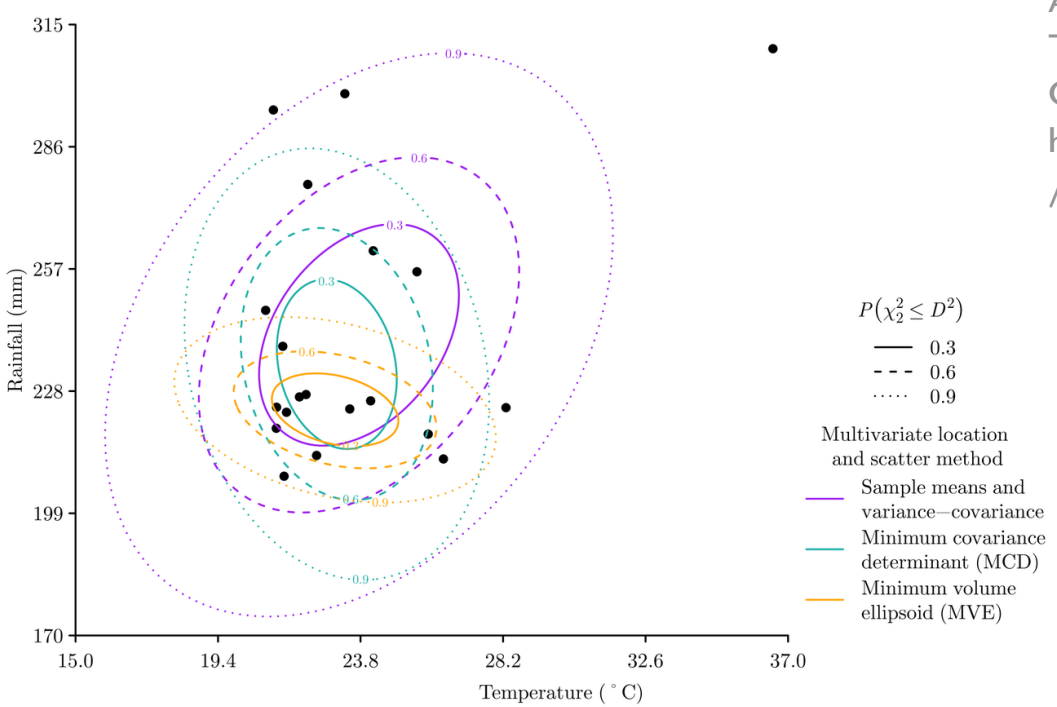
Donald Knuth
Computer History Museum's Revolution Exhibition (2011)

Modern Search Algorithms

- *k*-**NN search** - Find the *k* closest points to point *P*.
  - PCA into feature space, followed by k-NN classification.

- **Mahalanobis distance** - a measure of the distance between a point *P* and a distribution *D*.

Hypothetical 2D example of Mahalanobis distance.



Supervised learning

Supervised learning is task of learning a function that maps an input to an output based on example input-output pairs.

1. Infer a function from labeled training data.
   - Use training examples to get training data.
   - Each example is a pair of an input object and a desired output value, e.g. ("Δ–9 THC", "delta_9_thc").
2. Map new examples.
   - Generalize from the training data to unseen situations.
3. Re-train the model with new training examples.

Goal: Correctly determine the class labels for unseen instances.

Cannabis Data Science Application

Cannabis Data Science Application

- Can we use **matching models** to find cannabis products similar to a given product?

🙏 Thank you for coming.

Insights of the Day

- Small, seemingly inconsequential actions can have profound long-term effects because of **compounding**.

What is on your mind for next week?