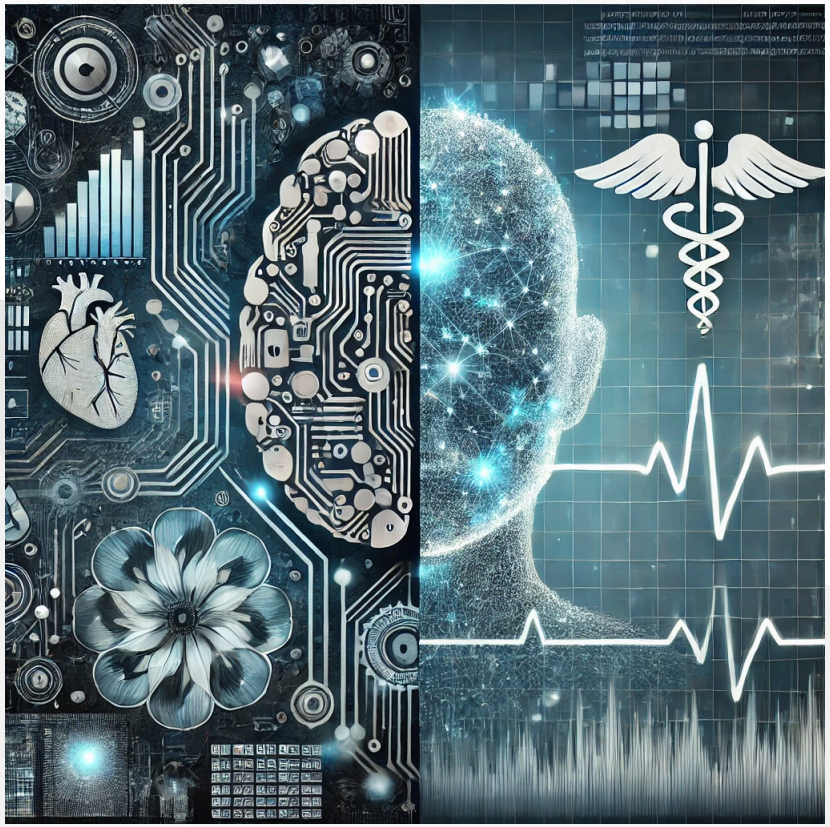

Feature Engineering

The Machine Learning Fundamentals

What is machine learning?

Machine learning fits mathematical models to data in order to derive insights or make predictions.

> [Machine Learning is the] field of study that gives computers the ability to learn
> without being explicitly programmed.
> —Arthur Samuel, 1959

These models take **features** as input. A feature is a numeric representation of an aspect of raw data.

Feature engineering

Feature engineering is the act of extracting features from raw data and transforming them into formats that are suitable for the machine learning model. It is a crucial step in the machine learning pipeline, because the right features can ease the difficulty of modeling, and therefore enable the pipeline to output results of higher quality.

Machine Learning is great for:

- Problems for which existing solutions require a lot of hand-tuning or long lists of rules: one Machine Learning algorithm can often simplify code and perform better.
- Complex problems for which there is no good solution at all using a traditional approach: the best Machine Learning techniques can find a solution.
- Fluctuating environments: a Machine Learning system can adapt to new data.
- Getting insights about complex problems and large amounts of data.