Fiche d'auto-évaluation 13

September 26, 2025

1. What is permutation importance and how do we calculate it?
2. Does the permutation importance give information about the dataset (information that does not depend on the model used) or does this information also depend on the model used?
3. What does the Kaplan-Meier estimator predict? Is it useful to predict a type of anomaly? Or to have an idea about the probability of failure of a machine?
4. What does the survival function $S(t) = \Pr(T > t)$ mean?
5. Is the survival function $S(t) = \Pr(T > t)$ monotone? If yes, increasing or decreasing? What is its value for $t = 0$? And for $t \to +\infty$?
6. Define the hazard function.
7. What are the models we have seen to estimate the survival function and the hazard function, respectively?
8. In the context of predictive maintenance, give some examples of censored samples.
9. What is the concordance index? Build a small example with a small sequence of events and imagine one model that predicts the order of these events. Compute the concordance index.
10. Imagine you are production engineer in a plant that works at very high temperatures. You have installed there two models of sensors and you have collected data about their functioning. In particular, you have annotated the time in which each sensors break. Based in historical information, you would like to compare their quality, in terms of resistance (survival probability). Which curves could you draw to do so? Draw some hypothetic curves, imagining that one of the two models of sensors is more resistant than the others.
11. .