

Given the current viability function we can already determine the optimal counterfactual:

The optimal counterfactual flips the strongly expected factual outcome of a model to a desired outcome, maintaining the same trajectory as the factual in terms of events, with minimal changes its event attributes, while remaining feasible according to the data.

The elements that fulfill these criteria make up the pareto surface of this multi-valued viability function. If each of the values are scaled a range between 0 and 1, the theoretical ceiling is 4. This value is only possible if we can flip the outcome of a factual sequence without changing it. As this is naturally impossible for deterministic model predictions, the viability has to be lower than 4.

Furthermore, we can already postulate, that a viability of 2 is an important threshold. If we score the viability of a factual against itself, a normalised sparsity and similarity value have to at its maximal value of 1. In contrast, the improvement has to be 0. The feasibility is 0 depending on whether the factual was used to estimate the data distribution or not. With these observations in mind, we determine that any counterfactual with a viability of at least 2 is already better than the factual.