

Strategies for analyzing data about symmetric paths

by Sven Nilsen, 2016

Symmetric paths are an important first step to explore the space of functions. Okay, so you got an algorithm that outputs a list from some data and a knowledge base of closures. How do you go about analyzing this data?

The problem is that even though the found symmetric paths are matching the data, they are not necessarily useful. For example, in the programming language Dyon, a function “add” overlaps with the Boolean operator “or”. Therefore, for every path found for “or” there is a path for “add”. We are interested in the paths we usually think of being related to Boolean data, but are also looking for surprising connections. Some paths are neither related to the way we think or telling us something new.

Notice that this might be different for machine learning, as we can not expect the same relations to be considered useful for both humans and machines. Humans want to extract new knowledge that might be used to solve problems either manually or with help from a computer. Machines need to extract new knowledge to solve whatever problem they are designed for. Humans and machines solve problems differently, therefore they might pay attention to different things to work efficiently. Yet, if there are some intrinsic patterns that make a common knowledge between human and machines more efficient, then that would be very useful to know.

Since the quality of the data we get out might not reach the standard we want, we might struggle to find or see patterns in it. A filter with feedback could be used to improve the quality of the data, while not being restricted to some rigid rules.

One idea is to use a “bad” and “good” filter. The bad filter is used to remove unwanted results, and the good filter is used to remove useful knowledge that has already been checked. We can filter this away while improving the input data used for the search.