

Examining the Plausible Side-Effects of Abduction

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Abstract

In the context of abduction in logic, whenever discovering abductive explanations for some given primary observation, one may wish to check too whether some other given additional secondary observations are true, as a logical consequence of the abductive explanations found for the primary observation. In other words, whether the secondary observations are plausible in the abductive context of the primary one, a common scientific reasoning task.

Thus, one may want to find abductive explanations for such secondary observations strictly within the context of the abductive explanations found for the primary observation, namely disallowing new abductions for explaining them. And even to do so without having to produce a complete model.

As it were, the explanations of such observational consequences may just consume, but not produce, the abduced atoms of the abductive justifications for the primary observation.

We show this type of reasoning requires a new abduction concept and mechanism, that of "contextual abduction". Moreover, we examine and formalize its variants, including its use in expressing counterfactual reasoning.

We illustrate, by means of examples, how one can employ these concepts to investigate plausible side-effects of interest (the inspection points) in order to help choose among abductive solutions.

Keywords: Contextual Abduction, Side-Effects, Plausibility.