
From computational methods to the history of science and back

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Abstract

In this talk I will discuss prospects and limitations of using computational methods to analyze case-studies from the history of science. I will start by examining agent-based models (ABMs), which have been motivated as providing potential explanations for concrete episodes from the history of science. To this end, I will present a specific type of targeted robustness analysis, which helps in assessing the explanatory power of a given ABM with respect to a concrete historical episode. I will argue that such an analysis can reveal possible problems not only in the application of a given model, but also in received historical narratives about scientific episodes, leading to their re-examination. This will be illustrated by a concrete episode from the history of medicine, the research on peptic ulcer disease, which has often served as a motivation for ABMs of science. Beside discussing simulations aimed to represent this case-study, I will show how digital textual analysis can serve as a complementary computational method, providing significant insights into this historical episode. (The first part of the talk will be based on joint work with AnneMarie Borg, Daniel Frey and Christian Straßer; the second part will be based on joint work with Bartosz Radomski and Kim Naumann.)

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