

Toward Anti-Formalist Computer Science

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Abstract

The Lakatos-Feyerabend-Kuhn methodology of scientific research programmes (LFK) theory is applied to disprove formalist philosophy of computer science (CS). The LFK theory conforms to the development of science during the 20th century by insisting that science and philosophy of science must be studied by analyzing research programmes as case studies in their historical context. The formalist CS research programme and its un-sceptical acceptance of the artificial intelligence (AI) research program are disproven using the mathematical and philosophical results of the LFK programme. The paper shows that AI is a degenerating research programme in the LFK sense and then continues by disproving the core claims of formalist CS. The following negations are proven: 1. Probabilistic analysis can not be applied to scientific theories because all theories of knowledge have zero probability. A result of this analysis is that quantum computation is nothing more than study of a particular type of imagined computational oracle. 2. There are other possibly superior alternatives to the NP completeness definition of computational hardness. Characterization of computational hardness is a 'quasiempirical' scientific problem following Lakatos' definition of 'quasi-empirical'. 3. Formal theories of computer programming are wrong and Feyerabend style 'anything goes' methods are superior. The paper concludes with a discussion of why it has been so difficult to disprove formalist CS even though formalist CS fits the LFK model of a degenerating research programme.