Computer Tractability - Beyond Turing?

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Abstract. A fundamental problem in the theory of computing concerns whether descriptions of systems at all times remain tractable, that is whether the complexity that inevitably results can be reduced to a polynomial form (P) or whether some problems lead to a non-polynomial (NP) exponential growth in complexity. Here, we propose that the universal computational rewrite system that can be shown to be responsible ultimately for the development of mathematics, physics, chemistry, biology and even human consciousness, is so structured that Nature will always be structured as P at any scale and so will be computationally tractable.