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We study the average complexity of solving structured polynomial systems that are characterised by a low evaluation cost, as opposed to the dense random model. Firstly, we design a continuation algorithm that computes, with high probability, an approximate zero of a polynomial system given only as a black-box evaluation program. Secondly, we introduce a universal model of random polynomial systems with prescribed evaluation complexity L . Combining both, we show that we can compute an approximate zero of a random structured polynomial system with n equations of degree at most D in n variables with only $\text{poly}(n, D)L$ operations with high probability. This exceeds the expectations implicit in Smale's 17th problem.

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