

## How many limit cycles are there in an ODE system with random coefficients?

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This talk will discuss Hilbert's sixteenth problem from a probabilistic perspective. The broad question is "What can be said about the limit cycles of a typical planar vector field?" We will give particular attention to the simple case of limit cycles of a perturbed linear center. When the (bivariate) perturbative polynomials in the ODE system have i.i.d. coefficients, the problem of studying limit cycle bifurcations reduces to the study of zeros of a certain random univariate polynomials with independent but not identically distributed coefficients. Namely, the coefficient variance is inversely proportional to degree. This falls at the critical case of the "generalized Kac polynomials", and determining the average (for distributions beyond the Gaussian setting) required a novel adaptation of Tao and Vu's universality methods. This is joint work with Manjunath Krishnapur and Oanh Nguyen.

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