

## On the Complexity of the Pancake Problem

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We study the computational complexity of finding a line that bisects simultaneously two sets in the two-dimensional plane, called the *pancake problem*, using the oracle Turing machine model of Ko. We also study the basic problem of bisecting a set at a given direction. Our main results are: (1) the complexity of bisecting a nice (thick) polynomial-time approximable set at a given direction can be characterized by the counting class  $\#P$ ; (2) the complexity of bisecting simultaneously two linearly separable nice (thick) polynomial-time approximable sets can be characterized by the counting class  $\#P$ ; and (3) for either of these two problems, without the thickness condition and the linear separability condition (for the two-set case), it is arbitrarily hard to compute the bisector (even if it is unique).