

A probabilistic approach to real enumerative geometry.

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Enumerative geometry deals with the problem of counting ("enumerating") geometric objects satisfying some constraint on their arrangement. For example: "how many lines in three-space intersect at the same time four given lines?"

The answer is two if we are allowed to look for complex lines, but it depends on the four given lines if we search for real lines. In the complex framework this question (and similar) can be answered using a beautiful, sophisticated technique called Schubert calculus: it is the study of the way cycles intersect in complex Grassmannians. Unfortunately, over the reals this technique loses its power: this is the old problem of finding real solutions to real equations, for which the number of complex solutions only gives upper bounds.

In this talk I will present a probabilistic approach to this problem, trying to address questions like: "how many lines in three-space intersect four given random lines?"

This is joint work with P. Bürgisser