

# Knot Probabilities in Random Diagrams

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Keywords:

Suppose that one is given an  $n$ -crossing knot diagram chosen at random from the (finite) set of such diagrams. What is the probability that it is a diagram of the unknot? In this paper, we report on a computer experiment which gives precise answers to this and similar questions for  $n \leq 12$  by direct enumeration and classification of knot diagrams. From the point of view of classical knot theory, this is a particularly simple model of random knotting. Part of our interest is to provide data which can be compared to results about more complicated distributions, such as the distribution of knots provided by selecting random closed equilateral  $n$ -gons, closed lattice walks, or in combinatorial models such as Even-Zohar et. al.'s *Petaluma* model.

## 1. DEFINITIONS

definition of diagram arnold's plane curve invariants equivalence relations

## 2. CONSTRUCTING THE DATABASE OF DIAGRAMS

plantri and the plantri theorem reduction theorem for shadows reduction for diagrams

## 3. CLASSIFYING KNOT TYPES

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#### 4. RESULTS

giant pictures, compared with tait's classification our distributions monogon and bigon fractions degree of alternatingness universal properties? comparison with distribution from ERPs, lattice walks, and petaluma.

#### 5. FUTURE DIRECTIONS

transitions, unknotting number and so forth.