

# A Brief Introduction to Percolation Theory

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## **Abstract**

Consider a one metre by one metre cube of water-permeable material. What is the probability that that if water is poured on top of the cube it may percolate all the way through the cube and out the opposite face? Initially developed by Paul Flory and Walter Stockmayer in 1944 whilst studying the gelation of polymers, Percolation theory attempts to answer such questions through a statistical analysis of graph configurations in both directed and undirected fashions. This essay will introduce the basics of percolation theory, first in one dimension and then working upwards to two dimensions before moving off to talk about some of its applications.

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## 1 Introduction