

Cake cutting: networked fairness, envy and truth

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Cake cutting is a classic resource allocation problem in which a central decision maker divides and allocates a divisible and heterogeneous good, known as a cake, to a set of agents with individual valuation functions, with the goal of balancing efficiency and fairness. Despite its seemingly simple setting, the problem compasses rich structures and has been a central topic in resource allocation for many decades.

In this talk, I will give an overview of some recent research on this topic. The goal is to give the audience a taste of different fair division challenges and explain how computational thinking could help in addressing them. Among other things, I will talk about the elusiveness of envy-free cake cutting, and a new framework that generalizes proportionality and envy-freeness to a network setting. I will also take a game-theoretic viewpoint and discuss the challenge of designing envy-free cake cutting algorithms that are immune to manipulation.