

An introduction to computational graph theory and generation algorithms – Part 1: Cubic graphs and snarks

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Computers are often used in combinatorics to determine if combinatorial objects with given structural or extremal properties exist as these existence problems are often too complex to solve by hand. This is done by designing and implementing generation algorithms which construct combinatorial objects from a given class (typically avoiding the generation of isomorphic copies) and analysing the resulting objects.

In this talk we will give an introduction to computational graph theory and the design of generation algorithms in particular. We will also give concrete examples of how these generation algorithms have helped to gain new insights and solve problems by presenting a specialised generation algorithm for cubic graphs and snarks.

Keywords: generation algorithm, cubic graph, snark