



CLEVER COUNTING OF THE NUMBER OF CERTAIN DISCRETE STRUCTURES

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Cayley Graphs are an extensively studied class of graphs, but many graphs, even those that are vertex-transitive, are not Cayley. Ginette Gauyacq’s paper “On quasi-Cayley graphs” introduces a related structure, the quasi-Cayley graph. She created these as Cayley graphs over a quasi-groups, whose multiplication tables are Latin Squares, which she called “regular families”.

Róbert Jajcay and Gareth Jones in their paper “ r -regular families of graph automorphisms” generalised the aforementioned structure into “ r -regular family” in order to measure how far a given vertex-transitive graph is from a Cayley graph. With the help of the computer power, our current research is aimed at the generation and enumeration of these r -regular families and also to gain further insights about these unexplored structures.

In this talk, we will examine several variations of an algorithm for upper bounds on the total number of r -regular families for a fixed number of permuted elements in feasible computation time. This method of counting could turn out to be much more general-purpose and usable in other discrete enumeration problems.

Financované EÚ NextGenerationEU prostredníctvom Plánu obnovy a odolnosti SR v rámci projektu č. 09I03-03-V02-00036