**Counting Magic Venn Diagrams**

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A *Magic Venn Diagram (MVD)* is a Venn diagrams where $r$ specific regions in the diagram are labeled $1, ..., r$ and fulfill the following two conditions: (1) Each region has a distinct label. (2) If we add up the labels of all regions in a set, then these sums must be the same for all sets. The sum of labels of all regions of a set in a MVD is called the *magic sum*. The Magic Venn Diagram problem requires determining the number of MVDs for a given number of sets and given regions to be labeled. We have developed and implemented a backtracking search algorithm that solves the MVD problem. The algorithm prunes the search tree by maintaining upper and lower bounds for the magic sum. In order to avoid counting MVDs with the same combinatorial structure multiple times, the algorithm uses a representation that is unique for all combinatorially equivalent labelings. We could solve all instances with Venn diagrams consisting of up to four sets. Some of these instances have not been solved before as they are too large to be solved by hand. In this talk, we present the algorithm and the computational results.

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