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*Investigating Addition Tables for Digit Representations*

In my research, I am investigating the complexity of algorithms for computation with multidimensional digit representations. Digit representations in one dimension, such as base 10 or base 2, were a major historical advance for arithmetic. The standard representation of vectors involves multiple components, rather than being purely a digit representation, so my research asks the question: are multidimensional digit representations computationally useful?

The first step in this research project is to investigate addition tables for multidimensional representations. A multidimensional representation with  $n$  digits can be mapped to a one-dimensional representation with  $n$  digits, but with a non-standard addition table. This talk will present some results on addition with novel addition tables.