

## Constructing good embedded lattice sequences with millions of points

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Lattice rules are a family of equal-weight cubature formulas for approximating high-dimensional integrals. By now it is well established that good generating vectors for lattice rules having  $n$  points can be constructed component-by-component for integrands belonging to certain function spaces. However, though the lattice rules constructed this way are extensible in dimension, they are not extensible in  $n$ , in the sense that changing  $n$  means the generating vector would need to be constructed anew. In this talk I will start with a review of recent advances in this research area and then introduce a new algorithm for constructing good generating vectors for embedded lattice sequences. Our generating vectors can be used with  $n$  ranging from roughly a thousand to a million!