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Haskell and the Theory of Oriented Matroids

The use of functional programming within the theory of oriented matroids helps very much to deepen the understanding of various data structures within this fundamental part of Discrete Geometry. The author uses the functional programming language "Haskell" and main aspects of his forthcoming book, *Computational Oriented Matroids* (Cambridge University Press, 2005), to underline the above assertion. His intention is to invite the novice, perhaps even a novice in both disciplines, in Functional Programming and in the Theory of Oriented Matroids, to understand the benefit of putting these disciplines to work together.

With a 3-page list of basic Haskell functions, we cannot only write the Sieve of Erastostenes for finding prime numbers as an executable line $ps = \mathrm{sieve}[2\ldots]$ where $\mathrm{sieve}(p : ns) = p : \mathrm{sieve}[n \mid n < -ns, n' mod' p > 0]$, we can also reduce the burden of dealing with sign vectors that seem to have no geometric meaning for the novice.