0.1 *mwp*-Bounds Analysis

The *mwp*-flow analysis [1] is one example of an ICC-based system. It is a sound computational method that certifies polynomial bounds on the size of the values manipulated by an imperative program. It provides a certificate guaranteeing that the program uses throughout its execution at most a polynomial amount of space and, if a program terminates, it will do so in polynomial time in the size of its inputs. The analysis computes, for each program variable, a vector tracking how it depends on other variables. The vector values are determined by applying the nondeterministic rules of the *mwp*-calculus to the commands of the program. Those vectors are collected in a matrix. A program is assigned a matrix only if all the values in it are bounded by a polynomial in the input sizes. This technique is compositional and operates on a simple, imperative language.

[1] Neil D. Jones and Lars Kristiansen. "A flow calculus of *mwp*-bounds for complexity analysis". In: *ACM Transactions on Computational Logic* 10.4 (Aug. 2009), 28:1–28:41. DOI: 10.1145/1555746.1555752.