The Universal Perspex Machine is a theoretical, continuous, super-Turing machine that operates geometrically. It can be simulated approximately on a digital computer using transrational arithmetic. It is a Single Instruction, Zero Exception (SIZE) machine. It is the ultimate RISC!

The figures below show C code for the Travelling Salesman problem compiled into perspective simplexes, i.e. into perspexes.

Transrational arithmetic is a total arithmetic that allows division by zero.

This does not give rise to contradictions because transrational arithmetic has an algebraic structure that is more general than a field. In particular, division is defined in a way that is more general than the multiplicative inverse.

The whole of existing mathematics remains intact, but is extended by transrational arithmetic.

Transrational arithmetic has a number at each extreme of the number line: $-\infty = -1/0$ and $\infty = 1/0$. It also has a number, nullity, $\Phi = 0/0$, that lies off the number line.

This exposes some faults in IEEE floating-point arithmetic. For example, it takes two bits, not one bit, to encode the sign of a number: negative, positive, zero, nullity.