Topic   Arithmetic algorithm of Surreal Numbers

Abstract   The surreal number system is a totally ordered proper class containing the real numbers as well as infinite and infinitesimal numbers. A surreal number is sometimes defined as a function from an initial segment of the ordinals into the set $(+, -)$, usually leads to an infinite sign sequence. It can also be expressed uniquely in a normal form, as $\sum_{i<\alpha} \omega^{a_i} r_i$.

In this talk I will present some algorithms for addition, multiplication and division on the real field. Besides, we will cover the normal form and sign sequence of surreal numbers, which will be crucial for arithmetic algorithm of surreal numbers of length $> \omega$.