
BERN-FRIBOURG GRADUATE SEMINAR

a seminar for Master and PhD students

Wednesday 19th April, 2023: 17:15 - 18:00

Room B7, Exakte Wissenschaften, Bern

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The Exponent of Matrix Multiplication and Asymptotic Tensor Rank

Abstract

How quickly can the multiplication of two n -by- n matrices be performed? If you use the standard algorithm you need n^3 multiplications. It turns out, however, that there are more efficient algorithms, and the number of multiplications in the best known algorithm grows asymptotically like $n^{2.38}$. It is an open question whether this can still be further improved, and what the smallest number ω is, such that the number of multiplications needed grows like n^ω .

In this talk, we will approach this question by looking at ranks of certain tensors. In particular, it turns out that calculating this ω is equivalent to calculating an asymptotic version of tensor rank of the 2-by-2-matrix-multiplication-tensor.