Michael Drmota. Distribution properties of subsequences of automatic sequences.

Abstract. Automatic sequences and their number theoretic properties have been intensively studied during the last 20 or 30 years. Since automatic sequences are quite regular (they just have linear subword complexity) they have no quasi-random behaviour. However, the situation changes drastically when one uses proper subsequences, for example the subsequence along polynomials like squares or the Piatetski-Shariro sequences. It is conjectured that the resulting sequences are normal sequences. Recently this could be verified for several classes of automatic sequences. The situation is more difficult for subsequences along primes. It is certainly out of reach to prove a normality result since there is no available technique to handle consecutive primes. Nevertheless there should be a limiting distribution along the subsequence of primes which is also related to the Sarnak conjecture. And actually the Sarnak conjecture can be verified for several automatic sequences including sequences that are generated by synchronizing automata.

This kind of research is very challenging and was mainly motivated by the Gelfond problems for the sum-of-digits function. In particular during the last few years there was a spectacular progress due to the Fourier analytic method by C. Mauduit and J. Rivat. The purpose of this talk is survey these and recent developments and to present the key techniques for obtaining these distributional results.