Effective Descriptions of Mathematical Objects and the BSS-RAM Model

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We deal with questions arising from the comparison of some machine-oriented models of computation. Models, such as the uniform BSS model and the model based on Type-2 Turing machines, are used in order to analyze the algorithmic complexity of mathematical problems and their degree of unsolvability, respectively. Since, in this connection, various mathematical functions, several types of sequences and their limits, algebraic sets and their measures, and the like play an important role, we also want to consider some further types of Type-2 machines that can work over suitable algebraic structures. For finite alphabets, the random access machines of Type-2 correspond to the Type-2 Turing machines studied in the field of computable analysis. Other machines are generalizations of the analytic machines and infinite Turing machines. We will discuss the possibilities to transfer results from one model to another and suitable representations for the considered mathematical objects within this framework.