

This bachelor's thesis focuses on discrete systems with random input. The main attention is paid to random walks, the reflection principle, and their applications. First, the basic concepts and definitions related to random processes and discrete-time Markov processes are presented. Subsequently, a detailed analysis of the symmetric random walk is provided. A key topic of the thesis is the reflection principle, which is applied to a simple symmetric random walk and further extended to walks with steps with double exponential distributions. The distribution of the running maximum of a symmetric random walk with both discrete and absolutely continuous steps is derived.