

The thesis focuses on filtering and prediction of discrete time processes. We begin by introducing the elementary notations and theory of discrete-time Markov chains and random walks. We then describe the approach to filtering methods, accompanied by comments, figures and examples. After that we prove one of the fundamental theorems about filtering equations and explain the connection between these equations and the introduction of the chapter by graphically and numerically solving two problems. Finally, we end the paper with a brief description of the topic of prediction and prove a theorem that we then apply to a specific problem.