

ABSTRACT

The paper entitled “Random methods in the study of information transmission systems” presents a study of users’ behavior during the navigation on a web site and a method for the structure optimization of a web site that uses properties of the Markov chain and important notions from the information theory.

Chapter 1 contains a presentation of the Web Data Mining research field and the contributions of the paper.

Chapter 2 contains an introduction in probability theory and presents some important Markov chains properties.

In chapter 3 we present some fundamental elements from the information theory: entropy, entropy rate, Markov chain entropy, typical set and the Asymptotic Equipartition Property.

Chapter 4 contains a presentation of the web applications components and the most important Data Mining techniques for discovering user web navigation patterns in web log data.

In Chapter 5 we give the definition of the navigation typical trails in a web site modeled as a Markov chain and we propose the method DNNT (Determining the Navigation Typical Trails). We propose the method SSO (Site Structure Optimization) for the optimization of the structure of a web site. The chapter ends with the experimental results that use the web log data collected from the log files of an e-commerce web site.