

ABSTRACT

The masters' thesis: 72 p., 6 fig., 3 tabl., 26 sources and 3 appendices.

The topic of this masters' thesis is "Stochastic modeling approach to the cars' parking process research".

The object of this thesis is the set of packing and parking processes.

The subject of this thesis is the set of asymptotic properties of several generalizations of Rényi parking and packing model.

The purpose of this thesis is the investigation of asymptotic properties of generalized Rényi parking and packing model defined by mixture of uniform and determined distributions.

In this paper the following analytic approaches are used: operational calculus methods, delayed differential equations methods, tauberian theorems. Quadratures are used for numerical integration. Simulations are made based on traditional Monte-Carlo paradigms.

Thesis results:

- integral equation for generalized model was built;
- was proven that it is possible to apply tauberian theorems in the context of generalized model;
- asymptotic equivalence of expectation of saturation level and linear function was shown;
- exact, albeit slightly complicated formula for linear function slope was inferred;
- the asymptotics were refined using Mellin transform;
- was proven that second moment is bounded with sub-quadratic function;
- law of large numbers analogue was proven for saturation level.

STOCHASTIC PROCESS THEORY, PROBABILITY THEORY,
DELAYED DIFFERENTIAL EQUATION THEORY, OPERATIONAL
CALCULUS, TAUBERIAN THEOREMS.