I. B. Frenkel, I. B. Gertsbakh and L. V. Khvatskin. Parameter Estimation and Hypotheses Testing for Nonhomogeneous Poisson Process, *TRANSPORT and TELECOMMUNICATION*, vol. 4, No 2, 2003, pp. 9–17.

We consider a nonhomogeneous Poisson process (NHPP) with intensity function $\lambda(t)$. This function is parameterized in two forms: log-linear with $\lambda(t) = \exp(\alpha + \beta t)$ and Weibull-type $\lambda(t) = \alpha^{\beta}\beta t^{\beta-1}$. Parameter estimation is carried out by the well-known maximum likelihood procedure. We present its modus operandi and show that there is one and the only one solution to the maximum likelihood equation for the log-linear form of $\lambda(t)$.

For the case of the known intensity function, testing the hypothesis that the given sample path is a realization of NHPP can be carried out on the basis of the following well-known fact. Let $t_1, t_2, ..., t_n$ be the instants of event occurrences in NHPP. Consider the following time transformed process $(T_1, T_2, ..., T_n)$, where $T_i = \int_0^{t_i} \lambda(v)dv$. This process is a standard Poisson process (with $\lambda(t)$ = 1) if the original process is NHPP. Therefore, the intervals between events in the transformed process form a sample of i.i.d. standard exponential random variables.

We present some numerical examples and show how the above described procedure works.

Keywords: nonhomogeneous Poisson process, parameter estimation, time transformation, hypotheses testing

M. Mazūra. Prognostication of Transport Activity and Reliability, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 18–27.

The importance of forecasting the economic characteristics of transportation (i.e. the amount of freight and passengers carried, the turnover rate of freight and passengers, etc. in transportation as a whole and in particular areas using various transport facilities) is demonstrated. Methods for predicting the development of transportation based on multidimensional regression and correlation analysis and realizing mathematical models for finding linear and non-linear multidimensional regression equations as well as a mathematical model for choosing linear and non-linear regression equations, more accurately approximating the empirical data, are presented.

The techniques aimed to obtain and apply the linear correlation coefficient and correlative relationship in determining the forecast accuracy is also given. The efficiency of methods, determining the linear correlation coefficient and correlative relationship, used in achieving higher accuracy of forecasts is shown.

Keywords: reliability, transport, freight

I. Kabashkin. Freight Transport Logistics. Case Study in Latvia, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 28–32.

In 2001 the European Platform for Transport Research (EPTR) was established to improve co-operation and co-ordination between national transport research programmes. Of course several organisations and networks of co-operation already existed before. The aim of EPTR is not to compete with these, but to identify what measures are needed in order to further improve the research co-operation and hopefully create the options for these actions in the future.

The paper gives review of the most important national research findings in the last decode and the most relevant areas and types of research co-operation in Europe.

Keywords: logistics, freight, transport

Sh. Guseinov. On One Class of Regularization Methods, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 33–39.

Modelling many problems of mathematical physics, economy, statistics, actuary mathematics and etc., frequently we obtain operational equations of the first kind. As a rule, these equations concern to ill-posed problems. There are some iterative methods for solution of such problems. In the present work we consider the concrete iterative method and we estimate its degree of convergence without any additional conditions.

Keywords: mathematical physics, actuary mathematics, economy

A. Alexandrov, Yu. Barinov, A. Grakovski. Representation of Data Fusion and Method of Testing of Stereotyped Situations in Transport Telematic Systems, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 40–43.

The intelligent application systems (IAS) are intended for support of decision – making in logistics and telematics. The decision-making is an intelligent activity, which refers to the class of algorithmically irresolvable problems. The complication of processes in systems of telematics and logistics shows in an alloy of heterogeneous dates mapped with the help of modern information technologies on Web-pages.

Keywords: telematics, decision-making, data fusion, algorithmic undecidable problem, complexity, fractals

B. Misnevs. On-Time Product Delivery as the Quality Goal for the Software Engineering Process, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 44–48.

This paper is devoted to the verification of measurable quality goals established to fit both SEI CMM and ISO 9001:2000 standard requirements. On-time product delivery is defined as the company level quality objective. Definition of the goal is done implementing CMM Goal-Driven approach. A set of sub goals required to achieve the main quality goal is developed using the question-goal-metric (QGM) paradigm. Software development life cycle is analyzed, and appropriative quality indicators are determined. Practically accessible information for the selected quality management model is evaluated. A possibility of process trends recognition based on the actually collected data is analyzed. Examples of real software process trends regarding the quality goal achievement are presented. The area of applicability for the reviewed solution is discussed.

Keywords: CMM, ISO 9001:2000, quality goals, measurements, software engineering processes

V. Pavelko, J. Timoshchenko. Model of the Influencing of Sizes on Fatigue Life of Sheet Details from an Aluminium Alloy, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 49–56.

In science about strength of structural materials the fact of influencing of a detail absolute sizes on its longevity for a long time is known at variable stresses. The numerous attempts were undertaken to give satisfactory explanation of this appearance, and as defining reasons the scale and statistical factors were advanced.

In the present report the outcomes of special experiment on the fatigue, which has been carried out on sheet specimens from an aluminium alloy with a system of circle orifices are analysed.

Keywords: fatigue, scale, statistical factor, model

S. Orlov, S. Bachinska. The Functional Approach to a Resource Estimation of Object-Oriented Program Systems, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 57–61.

The resource estimation problem of object-oriented development at an early stage of the program project has the large value and urgency in modern software engineering. This article describes a FP based strategy offered for solution of this problem.

Keywords: function point analysis, use case model, resource estimation

K. Nechval, N. Nechval. Identifying an Observable System with One of Several Simulation Models, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 62–72.

In this paper, for identifying an observable system with one of several simulation models, a uniformly most powerful invariant (UMPI) test is developed from the generalized maximum likelihood ratio (GMLR). This test can be considered as a result of a new approach to solving the Behrens-Fisher problem when covariance matrices of two multivariate normal populations (compared with respect to their means) are different and unknown. The test is based on invariant statistic whose distribution, under the null hypothesis, does not depend on the unknown (nuisance) parameters.

Keywords: observable system, simulation models, identification

M. Moldovan, N. Nechval, E. Vasermanis, U. Rozevskis, K. Rozite. Testing for Two-Phase Multiple Regressions, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 73–81.

This paper describes a technique for detecting departures from constancy of regression relationships over time when regression analysis is applied to time-series data. The problem we consider is a special case of a general class of problems concerned with the detection of changes of model structure over time. The technique proposed here for solving the above problem is based on transforming a set of random variables into a smaller set of random variables that are independently distributed with parameter-free distributions. It allows one to eliminate unknown parameters from the problem and is especially efficient when we deal with small samples of the data. A numerical example is given.

Keywords: switching regression, segmented regression, change-points, detection

V. Rastrigin. Effect of the Road Surface Factors on the Urban Traffic Conditions, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 82–91.

This article deals with one of those possible aspects - the influence of quick changes of the road surface quality on the generalized travel cost as disutility measure.

A model of the influence of surface factors to network traffic conditions is considered. Road surface quality is assumed to be weather dependent, and may change quickly for the worse as a result of snowfall, for example. In turn, road service cleaning activity may change these results to the better. The similar effect may have long lasting changes of the road surface quality as the result of surface degradation or surface recovery and renovation. The corresponding loss function may be considered as the criteria for optimal road service cleaning (recovery) strategy.

Keywords: tansportation networks, surface factors, traffic conditions, equilibrium analysis

N. Nechval, E. Vasermanis, U. Rozevskis, K. Rozite, K. Nechval. Characterization Theorems and Goodness-of-fit Testing on Small Data Samples, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 92–100.

The objective of this paper is to focus attention on a new practicable statistical approach to goodness-of-fit testing which is based on the notion of sufficiency and provides a unified efficient approach to the problem of test construction in the presence of nuisance parameters. The obtained results are applicable to model selection.

Keywords: characterization theorems, small sample, goodness-of-fit testing

A. Kuznetsov, Yu. Paramonov. Inspection Data Use for Inspection Program Development, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 101–107.

The inspection program development on the base of preliminary full-scale fatigue test results and its correction by the use of inspection data in service are considered. Since the years 1953 & 1954, when there were three consequent fatal crashes of Comet's aircraft, then up to now the problem of metal fatigue of aircraft draws attention of the entire aviation world.

This paper is devoted to discussion of this problem. Exponential model of fatigue crack growth was used.

Keywords: fatigue crack, reliability, aircraft inspection program, Monte-Carlo modelling

E. Vasermanis, N. Nechval, U. Rozevskis, K. Rozite, K. Nechval, V. Strelchonok. Minimum Variance Unbiased Estimation of Availability, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 108–115.

In the process of determining the worth of equipment to perform a given task the engineer is often primarily concerned with three quantities: reliability, maintainability, and availability, A. In many instances the most pertinent of the three is the latter. In this paper, the case is considered when the time between failures and the time to repair are independent negative exponential random variables. A new approach to determining the minimum variance unbiased estimator (MVUE) of A that emphasizes pivotal quantities is presented. We consider estimation problems that are invariant under a group of transformation G such that the induced group $\overline{G}$ acts transitively on the parameter space.

Keywords: system availability, minimum variance unbiased estimator, technique for constructing

V. Shelkovnikov. Increasing Radio Communication Efficiency with the Transport Facilities, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 116–118.

Radio communication systems accomplish one of the main functions in the information provision of the processes of controlling movable objects, being the only means of the exchange of the operation information between dispatchers' stations and movable objects crews.

The work shows the principal possibility of increasing the effectiveness of the short wave radio communication with the vehicles through the application of the small size receiving ferrite aerials with the electrodynamics screens.

Keywords: transport facilities, radio communication reliability, receiving ferrite aerial

R. Nikolaev, N. Nechval, V. Strelchonok. Model of Vehicle Allocation Problem with Uncertain Demands, *TRANSPORT and TELECOMMUNICATION,* vol. 4, No 2, 2003, pp. 119–124.

In this paper we introduce a model that can assist airline planners in deploying their fleets as efficiently as possible. Specifically, we outline an optimization model that assigns a fleet of aircraft of different types to routes to maximize profits. An algorithm for solving nonlinear transportation problem is suggested. It is based on the use of the Lagrange multipliers. We define and illustrate the use of the loss function, the cost structure of which is piecewise linear. The necessary and sufficient conditions for optimality are given.

Keywords: vehicles, allocation problem, optimization algorithm