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**GEOMETRIC OPTIMIZATION OF THE WINDSHIELD WIPER
MECHANISMS USING VIRTUAL PROTOTYPES**

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Abstract. In this paper, the geometric optimization of the windshield wiper mechanisms of the motor vehicles is performed, considering as example the wiper system of a domestic passenger car, DACIA type. Using a virtual prototype that was modeled with the mechanical system analysis and simulation software ADAMS makes the optimization. Parameterize the model, by transforming some geometric characteristics from the wiper system in design variables, design studies and design optimization were performed, having in view different specific objective functions that describe the behavior of the wiper mechanism.

Keywords: windshield, wiper system, virtual prototype, optimization.

**DYNAMIC SIMULATION OF THE MOTOR VEHICLES USING
COMMERCIAL SOFTWARE**

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Abstract. The increasingly growing demand for more comfortable vehicles nowadays imposes a new way of analyzing, with elaboration of models that are closer to the real systems on the vehicle. The simulation techniques allow the automotive engineers to conceive and equip virtual prototypes that permit a large-scale evaluation of the vehicle behavior. In the present paper, we attempt to carry out the simulation of the motor vehicles, using the commercial software ADAMS of MSC / MDI.

Keywords: multibody system, virtual prototype, dynamics, simulation.

**KINEMATICS OF THE OERLIKON MOBILE COUPLING, AS MULTI-BODY
SYSTEM**

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Abstract. The paper presents aspects regarding the kinematics of Oerlikon mobile coupling as multi-body systems. The mobile couplings are used in a lot of power transmissions at cars, road trucks, railway trucks, ships and other industrial systems. First it is presented the structural scheme of the analyzed mobile coupling. Then are defined: the parts of the multi-body system associated to the mobile coupling; the body reference frames and also the general reference frame; the geometrical and kinematics constraints. Finally, there are determined the kinematics equations, useful in analyzing the positions, velocities, accelerations of the couplings parts. The solutions of these equations are also useful to found the optimal geometrical configuration of the coupling, depending by the initial requests of a mobile coupling.

Keywords: Mobile coupling, structural scheme, multi-body system, geometrical and kinematical constraints.

STRUCTURAL SYNTHESIS METHOD OF TRANSVERSAL COUPLINGS WITH FIVE MOBILE BODIES BY MULTI-BODY SYSTEMS METHOD

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Abstract. Mechanical systems definition as multibody systems is a modern way of modeling in the aim of the real time simulation of complex product's dynamic behavior. In this paper is presented a method for structural synthesis of planar multibody systems of transversal couplings linkages with five mobile bodies. Based on an adequate graph (introduced by the authors in previous papers) and few specific conditions, like the degree of freedom and the type of geometrical constraints between the bodies, is made the synthesis of all possible graphs for transversal couplings as multibody systems with 5 bodies. New transversal couplings are also obtained.

Keywords: Mobile coupling, multi-body system, geometrical and kinematical constraints, associated graph.

DESIGN METHOD OF ELASTIC COUPLINGS WITH CUTTERED BOLTS AND NONMETALLIC INTERMEDIARY ELEMENTS FROM VARIOUS RUBBER QUALITIES

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Abstract. In this paper is present design method for new elastic couplings with cutered bolts and nonmetallic intermediary elements, which are realized from various rubber qualities. The novelty of this coupling type consist in existence of one disc between those

two semi couplings (the disc is not presents centering thresholds), of eight metallic plates and the nonmetallic elements from rubber are mounting on the cuttered bolts.

Keywords: elastic coupling, mechanic coupling, permanent coupling, nominal torsion moment, safety coefficient, new constructive forms, design method, stages of design, rigidity of coupling.

THE NECESSITY AND WAYS FOR REDUCING THE OPERATING TIME OF THE SHIP IN THE CONTAINER TERMINAL

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Abstract. Ports are regard nowadays to have an ever more active role in promoting logistics of intermodal transport chains. As a junction knot of transport chain, the maritime port, respectively the container terminal should offer better and cheaper services to its utilizes – ships and goods. The most important port indicator is the station time of the ship in port, respectively the operating time of ship in terminal.

This paper aims to identify the major factors, which influence the operating time of the specialized ship in the container terminal: supplying with performing equipment that has great productivity; utilizing the assisting systems and planning ship operating. The terminal logistic can also substantially improve the performance parameters. In this way, in container terminal of great dimensions, logistic has reached such a complexity degree that subsequent improvements need scientific methods for decision sustaining.

The activities complexity, the great number of aleatory factors which intervene, the impossibility of process anticipating for a larger period of time lead to the improvement necessity and making decisions in real time.

Keywords: container terminal; optimization; container yard, planning

ASSESSMENT AND EVALUATION OF DISCOMFORT IN SHIP ROOMS

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Abstract. In this report a methodology is suggested for determining the discomfort in ship rooms; on the basis of this methodology an option can be added to the global information-measurement system of the technical and functional condition of the ship by which to evaluate the discomfort. The existing methods have been analyzed and on the basis of a number of experiments in a test adaptation chamber followed by mathematical processing a formula adapted to small rooms has been deduced. This methodology enables incorporation into an automated system for control and evaluation of the conditions in ship rooms. Thus the discomfort can be measured in numerical characteristics or on a rank scale to be used when setting standards for ship lighting.

Keywords: discomfort, lighting, Epaneshnikov's method, Selner's method, Leuin's factor of influence.

ESTIMATION OF SOME SHIP DIMENSIONS AND THE MAIN ENGINE POWER OF BULK CARRIERS AND TANKERS DEPENDING ON SHIP DEADWEIGHT

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Abstract. At the stage of initial ship designing, different methods for estimating the main ship dimensions and the main engine power of bulk carriers and tankers are being used. On this purpose, this research summarizes various analytical dependences and develops them for bulk carriers and tankers.

Keywords: Initial design; main dimensions of ships; analytical dependences.

DISTANT SIMULATION AND TUTORIAL SYSTEMS ON BOARD. NEW APPROACHES IN MARITIME EDUCATION AND TRAINING

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Abstract. Starting with 2003, Constanta Maritime University (CMU) owned a simulation complex comprises of 3 state of the art simulators covering Full Mission Navigation Simulator, GMDSS Simulator and Engine Room Simulator. Therefore, now it became possible to train and assess students (cadets and junior engineers), officers of the watch and senior engineers at operational and management level in accordance with the provisions and requirements of STCW 95 and specific IMO Courses. Recently, CMU has joint an important EU project for distant simulation and tutorial systems on board. This will grant CMU a license to use this 4th web-enabled simulator for Cargo Handling. The project is under the Leonardo da Vinci program, the cooperation partners being: University of Bremen, Germany as promoter; Kongsberg Maritime, Norway with simulation technology; three Maritime Universities in Elsfleth, Oldenburg, Germany; Constanta Maritime University, Romania and Escola Nautica Infante D. Henrique, Lisbon, Portugal and also seven tanker companies in Europe.

Keywords: Distant simulation, Instructional design, Experiential learning, Learning Management System (LMS).

TIMETABLING PROBLEM SOLUTION WITH GENETIC ALGORITHM

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Abstract. This paper introduces a flexible method for scheduling a timetable using a genetic algorithm. The timetabling problem comes up in every educational institution. It is a special kind of optimization problem. A timetable is explained as a schedule with constraints placed upon it. There had been many attempts to address this problem using classical methods, such as integer programming and graph theory algorithms without much success. These methods also are difficult to automate the process. The solution, which this paper offers, includes a genetic algorithm implementation in order to give a maximal approximation of the problem, modifying a generated solution with genetic operators.

Keywords: genetic algorithm, timetabling, scheduling, constraints, optimization.

ECONOMIC MODEL FOR EVALUATION OF A RECYCLING PROCESS FOR SECONDARY RAW MATERIALS

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Abstract. Applied research usually pays very much attention to recycling plants, but the decision to invest in such sectors depends on the opportunity to gain new market openings. In this paper an economic model for cost centers is presented. By analyzing the collection and regeneration phases, the model gives each activity its respective costs and profits in the reutilization and recycling of secondary raw materials.

Keywords: recycling, raw materials, reprocessing, regeneration.