

Armed Forces Academy of General Milan Rastislav Štefánik



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— ABSTRACTS —

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The Armed Forces Academy of General Milan Rastislav Štefánik is the non structured faculty state military college. The Academy is situated in Liptovský Mikuláš, Slovak Republic. It is a school that has international acceptance and its main mission is to educate, improve skills and train students in higher and lifelong career education. Its mission is to develop good personality, knowledge creativity and motivation in students to prepare them for service to the country and to be effective within national and international environment.

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**SECTION
MECHANICAL ENGINEERING**

MANUFACTURING OF $Fe_3Al/OXIDE$ CERAMICS COMPOSITE POWDERS FOR LENS ADDITIVE TECHNOLOGY

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Abstract: This work presents the study of preliminary brief and execution of multivariant milling process in a planetary ball mill. As the batch material the mixtures powders of Fe_3Al and oxide ceramics (Al_2O_3 , Y_2O_3) were used. On the base of obtained results the powder composition in accordance with applied criteria for LENS technology was proposed. The rotational speed and time were changed during the milling process. The investigations of obtained samples were carried out by IPS U particles analyzer and XL30/LaB6 Philips scanning electron microscope. Only two of the 46 powder compositions were selected in accordance with applied criteria for LENS technology. Additionally, it was stated that increasing of ceramic content and rotational speed of milling process change significantly morphology of preparing particles powders.

Keywords: Fe_3Al intermetallic, planetary ball mill, oxide ceramics, LENS technique

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MODELING OF SUSPENSION SYSTEM IN LS - DYNA

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Abstract: The main objective of my paper is to create a 3D model of military wheeled vehicle Aligator 4x4 with an emphasis on suspension system. This model has been created in simulation program LS-Dyna. It has been created with an emphasis on damping and springing of shocks while the car is moving across various obstacles. The paper was elaborated because of further using in practice and further investigation. Vibrations of wheeled vehicles are monitored at the Armed Force Academy in Liptovský Mikuláš with measurement's device Pulse. Our future ambition is to compare the results from the simulation in LS-Dyna with real measurement. Furthermore we will modify this model in order to approximate to reality. This way finished model can be used for various investigation: comparing different types of dampers and springs, reacting the vehicles while it is moving across an obstacle and so on.

My paper is divided into the two main parts. First part comprises theoretical background about military vehicle Aligator 4x4, which is used in the Slovak Armed forces. Second part describes the process of creating vehicle's model and how we solved particular problems. The result of my paper is 3D model of military wheeled vehicle Aligator 4x4, which is ready for using in further investigation.

Keywords: modeling, simulation, suspension, LS-Dyna,

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HIGH PURITY MATERIAL AND METHODS FOR ITS POSSIBLE ACQUISITION

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Abstract: Aim of this work is to point out on the contemporary technologies and their utilization. To give new points of view towards purity of material. It is well known that sulphur or phosphorus have significantly negative effect on the quality of metallic materials especially on the steel. Lowering volume of those elements will change attributes of steel or similar materials. I present various technologies for material separation at the level of particles mass. Presented technologies have been already tested and proved. Their new usage in practice is subject of this work as well.

Keywords: high purity, separation, improving attributes of material

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COMPARISON OF THE TENSILE CHARACTERISTICS OF SELECTED WHEELED VEHICLES

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Abstract: Objective of this work is to compare the traction characteristics of the vehicles ALIGATOR 4x4, TATRA 815-7 4x4 and possible concept based on TATRA 815-7 4x4 in order to devise a suitable transport and combat wheeled vehicle for the Slovak Republic's Armed Forces. This vehicle should combine the advantages of previous vehicles and remove their disadvantages. The first chapter describes the selected basic tactical and technical data and operational data, selected data from the driving system and the gear mechanism vehicles Alligator 4x4, TATRA 815-7 4x4 and possible concept based on chassis TATRA 815-7 4x4. It further describes the external power and torque characteristics, which are necessary for calculating the tensile characteristics of selected vehicles. The second chapter deals with method of calculating the variables for calculating the tensile characteristics and the model of calculation.

Finally, I summarized the information that was obtained by comparing of the tensile characteristics of these vehicles. All calculations I have stated at tables in Attachments of work. Attachments also includes individual graphs tensile characteristics of the vehicles and separately for the gear of H and separately for gear of L.

Keywords: PVS alligator 4x4, TATRA 815-7 4x4, tensile characteristics, tactical and technical data, the transmission mechanism, the driving system, operating data

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COMPARE THE TENSILE CHARACTERISTICS OF THE SELECTED TRACKED VEHICLES

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Abstract: The main aim of my thesis was to calculate and compare the tensile and dynamic characteristics of 2 infantry combat vehicle (IFV - 2) with its tensile characteristics if its weight has been after its modernization increased to 18 tonnes. What would help the increase in weight is mainly upgrading ballistic protection for combat vehicles and to compare it to the tensile characteristics of the modernized IFV - M2 SK/CZ, which was presented at the exhibition IDET Brno in 2013. I have also calculated and compared the tensile and dynamic characteristic of these vehicles to IFV – 3 vehicle, whose weight is 18.7 tonnes and which has been used for several years in the Russian armed forces. For counting the tensile characteristics I have used tactical and technical data on both vehicles, which I described in detail in the first chapter of this work. In the second chapter I introduced the methods of calculating the variables. In the third chapter and in Attachments I presented comparisons of vehicles both with and without reduction. Particular Attachments include tables with various calculations and graphs where I compare both the performance of IFV - 2 before and after modernization, involving reduction and without it, and finally compare the tensile characteristics of the modernized IFV - 2 with Russian IFV – 3 as well as comparison of the concept of IFV - M2 SK/CZ with an alternative version with the engine from Tatra company. My work should especially point out the possibility of upgrading IFV – 2. When upgrading, it has to be considered that with increasing vehicle weight, the performance of its engine is decreasing.

Keywords: Infantry fighting vehicle, tensile characteristics, modernization, tactical and technical data, Propulsive system,

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CONCEPTUAL DESIGN OF RECONSTRUCTION OF TRANSMISSION OF INFANTRY FIGHTING VEHICLE BVP M-80A FOR INSTALLATION OF ENGINE OM457LA

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Abstract: This paper describes one solution of the reconstruction of transmission of infantry fighting vehicle (IFV) BVP M-80A in order to adjust it for the installation of the engine OM457LA. Modernization of the powertrain on IFV BVP M-80A, according to the project requests, should include the installation of new engine with minimal modifications on transmission, and should either keep vehicle's performances on the previous level or improve them. The issues described in the paper are shown through analyses of traction characteristics of linear movement and turning traction characteristics on the existing vehicle in order to determine its performances. After that, analyses of the possible solutions for the reconstruction of transmission and the proposed conceptual design are given. For the proposed solution defining of basic geometric parameters and calculating of safety factors were performed. The performances of the existing vehicle and the vehicle with a new engine and reconstructed transmission have been compared. This analysis has shown that the installation of the new engine will result in better performances of the vehicle.

Keywords: reconstruction; transmission; analysis; performances; engine

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SECTION
ELECTRONICAL ENGINEERING

AUTOMATED MASURING OF ANTENNA PARAMETERS AND MASURING OF ELECTROMAGNETIC FIELD IN GTEM WAVEGUIDE

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Abstract: Main idea of my project is to simplify measurements of antenna parameters and intensity of electric field in the TEM waveguide using a graphical program in the first part and construct three types of loop antennas which covers a broadband in the second part. In practice it is known that each of the measurement parameters of the antenna can be described with radio communication chain, while it is made up of equal parts. The aim of the first part of the project is to design a program in Matlab GUI. The function of this program is to perform automatic measurement of received power depending of frequency and then carry out the calculation of antenna gain and antenna factor. Gain of the antenna can be measured in two ways. Two identical antennas or unknown - etalon. The second part of the program assumes that the parameters of used antenna are known and with antenna factor by a mathematic expression can evaluate the electric field near the antenna. Program for measuring is user friendly. Evaluate gain, antenna factor and electric field depending on the frequency is the question of minutes. The measurement result is then the vector of Matlab. In the second section, I will be able to use a created program for self-constructed loop antenna with antenna factor which depends on the radius of the loop antenna. If you already know antenna parameters, measurements which detects the intensity of electric field can be performed and we can compare the measurement results with theoretical calculations of propagation of electromagnetic energy in the TEM waveguide. The whole measurement is done in the certified anechoic chamber and certified TEM waveguide, which owns The Armed Forces Academy in Liptovsky Mikulas . These chambers simulate infinite space in which there is no reflection of electromagnetic waves from the walls of the chamber and subsequent interference with the reflected energy. The entire measurement procedure, formulas necessary for the calculations and the theory that supports my project can be found in my paper.

Keywords: automated masuring, antenna parameters, masuring of electromagnetic field, GTEM Waveguide

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TIME-FREQUENCY ANALYSIS OF RADAR DOPPLER SIGNALS

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Abstract: This paper presents time-frequency analysis of signals using different window functions. The objective of the paper is to identify the basic spectrogram-based features characterizing various classes of targets and to extract salient features for classification. We used radar signals of moving targets which are analysed in licenced program software MATLAB™, using function spectrogram for presenting those signals. Radar signals are used from Radech database and we used four window functions to analyse them: rectangular, Hann, Hamming and Kaiser window. Furthermore, effects of every window function are shown when filtering received signal and effects of window size. After filtration, information of the signal depends on the quality of signal's spectrum. Analysed signals are from moving targets and feature extraction is explained to demonstrate Doppler's signature of target.

Keywords: Window function; Doppler signals; Periodic motion; Spectrogram; Quasi-periodicity

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ACTIVE ANTENNA FOR HIGH FREQUENCY BAND

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Abstract: This work is divided into three sections. The theoretical section of the paper deals with high frequency (HF) band or decameter band and propagation of high frequency electromagnetic waves. High frequency electromagnetic waves are spread bounce from ionosphere or transmit high frequency signals close to the Earth. The practical part describes the design and realization of Miniwhip active antenna for high frequency band. The Miniwhip active antenna is most common active receive antenna when low size of antenna is required. From design point of view, the antenna consists of two emitter followers created by one unipolar transistor and bipolar transistor. On output of the active circuitry is connected by fifty ohm coaxial cable. The design of Miniwhip consists of schematic of amplifier, schematic of power supply unit and description function of Miniwhip. Schematics of Miniwhip are show electronic parts, which are used in realization Miniwhip. The printed circuit board is design method of dividing lines, so that cuprum parts were fewest. Electronic parts of amplifier are soldering direct on cuprex- tit (cuprum board). The box of power supply unit is made from metal, because power supply was shielded from output of noise. Function of Miniwhip is about connected parts and about properties of electronic parts. The last part of work dealswith experiments focused on active antenna properties verification. For this purpose, the basic measurement setup was proposed. The measurements were carried out in G – TEM cell. In conclusion, the outputs of the measurement are described.

Keywords: high frequency band, Miniwhip, HF antenna

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TIME- USING TIME-FREQUENCY SIGNAL ANALYSIS IN SIGNAL INTELLIGENCE

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Abstract: Signals are main source of information for signal intelligence (SIGINT). The signal analysis is required in order to obtain necessary information from signals. From the SIGINT point of view, the main role of signal analysis is identification of radioelectronic objects symptoms and enemy activity detection. The signal analysis can be done in three domains: time, frequency and time-frequency domain. It is possible to use different algorithms or methods for signal analysis in each domain. The spectrogram is one of the most frequently used methods for time-frequency signal analysis in signal intelligence. The spectrogram provides possibility for monitoring of signal changes in time and frequency domain. The spectrogram is also useful for determining signal parameters such as frequency bandwidth, baud rate, symbol duration, modulation type, number of tones or frequency shift. The paper deals with the analysis of the purpose and function of spectrogram and verifies theoretical knowledge about it in practice. The paper also provides information about window function, its attributes, significance and effect on spectrogram. Also spectral leakage, as one of the main reasons of wrong determining signal parameters, will be explained. An effect of size and shape of window function on resolution abilities of spectrogram is shown on real record. In conclusion, the outputs of signal analysis experiments are evaluated.

Keywords: spectrogram, STFT, window function, spectral leakage, signal intelligence

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AUTOMATED PROCESSING OF ELECTROMAGNETIC FIELD SHIELDING MEASUREMENT

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Abstract: Theoretical part deals with propagating of electromagnetic waves in free space, main variables describing electromagnetic field and its properties, main technical standards for measuring of electromagnetic waves in anechoic chamber as well as the effect of antenna on the results of the measurements. The practical part of thesis begins with mathematical method of spline interpolation used in practical part of the thesis, describing computing process and differences between types of spline interpolation. Practical application of theory is the program developed in MATLAB R2010a software, which, based on known discrete values of frequency response of the antenna array via interpolation methods corrects results of measurements performed by antennas used by Department of Electronics, calculates the value of antenna factor based on two known measurement data where one measurement shall be performed by known antenna. Program can also fuse two measurement data performed by different antennas in wider frequency band. Using of different antenna factor for data correction is expected. To decrease number of errors, user of program is limited by automatic activation and deactivation of controls during work. This measure also helps user to control program without need of any special instructions manual.

Keywords: electric field, magnetic field, electromagnetic field, electromagnetic waves, antenna factor, electromagnetic field measurement, attenuation chamber, radio communication chain, spline interpolation

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RADAR ELECTRONIC PROTECTION TECHNIQUES

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Abstract: The current paper aims to discuss about the radar protection techniques and to explain how does it work. There are examined the requirements and benefits of adopting this type of techniques, especially in military service.

The latest technologies in this field have a huge impact on the armed conflicts of the future. It is important for us to understand the risks to which we are exposed and especially the ways in which we can prevent or combat future threats.

Key words: electronic warfare, jamming, electronic protection, Doppler signal, electronic attack.

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**SECTION
INFORMATICS**

FILE ACCESS MONITORING AND ITS UTILISATION FOR SECURITY

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Abstract: In recent years we have been witnessing violation of human rights regarding privacy. Ordinary people find it really difficult to protect themselves against stalking. These facts force us to resolve this complicated problem. There are more solutions and applications which focus on helping us protect our privacy. But we can't find any complex solution with necessary level of protection. So this is the reason, why this solution has been created— an application based on .NET platform. .NET platform is a virtual machine and provides possibility to start applications on different operating systems where .NET is installed. This platform allows higher level of protection and helps keep application protected from other processes. It's important because all applications with similar functionality require Admin rights. This solution built on .NET uses low-level API to obtain information about files used by the system. Low-level API provides higher level of safety, because the application doesn't access directly into the kernel core. Obtained information is analyzed in a few steps for detecting potential viruses and dangerous applications. The results of the analysis contain information about processes, files, access times, and other. This solution isn't universal and can't create ideal defense, because it can't detect inactive viruses or dangerous pieces of code, but, in some cases, it can help detect system violations and keep data safe.

Keywords: Security, Privacy, Data protection, Basic system analysis

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SECURE DATA BASED ON USE PASSWORD

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Abstract: At present, almost all data in electronic form, so access to them is easier. Working with them is very important so it is necessary to have fast access to them. There are many types of portable devices such as USB, CD, DVD, external HDD. Because of the importance of data on the disc, these data must be protected. Cryptography enables secure access to them. The data is encrypted and access to it have only selected people. Data must also be protected against attacks. It is important to choose the correct encryption algorithm.

Keywords: information security, cryptography, AES, secure data. brutal force attack,

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DNS ATTACKS AND RELATED PROTECTION

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Abstract: This document describes the principle of a DNS protocol, shows its importance, meaning and action. It describes the information in the header and the body of a DNS packet. In the next part provides an overview of the weaknesses of the system and analyzes its possible threats. Further is shown an experiment of DNS cache poisoning attack.

It proposes a method for calculating the time necessary for the successful attack with the given probability and applies this method to several attack scenarios carried out in real network conditions using a freely available implementation of a DNS cache poisoning attack.

The conclusion summarizes the security of the system as well as ways to protect yourself from similar types of attacks.

Keywords: DNS, cache poisoning, formal model, computer network, domain name system, DNS protection

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METHODS OF DATA TRANSFER ENCRYPTION IN LOCAL AREA NETWORKS

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Abstract: Information security and communication security as a significant part of it is becoming increasingly actual topic. The computer networks as a main communication concept in information technologies are forced to effective face against modern threats existing in the cyberspace. For that reason are used network security and encryption protocols, which provide needed information attributes during transfer in networks. Correct implementation of that protocols requires knowledge about principles of their work to reach optimal network security solution in organization.

Keywords: information security, network security, encryption, virtual private network, VPN, IPSec.

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ANALYSIS OF COMMUNICATION IN COMPUTER NETWORKS USING NEURAL NETWORKS

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Abstract: This paper deals with the possibility of using artificial neural network for analysis of communication in computer networks. The principles of artificial neural networks and possibility of using artificial neural network in a computer network that would work on the principle of the firewall are explained in this work. The product of this work is design neural network topology and its achievements.

Keywords: firewall, artificial neural network, analysis, computer network

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PRODUCTION OF 3D MODELS FOR SIMULATION SYSTEMS OPERATING IN REAL-TIME

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Abstract: Diploma thesis deals with the creation of 3D models with a focus on simulation systems operating in real time. The goal of the work was to understand the principles and procedures of technologies working with 3D graphics and apply knowledge in the design and processing of 3D models. In the first chapter are discussed standardized procedures of 3D models production, where the first mentioned is process of model creation itself. Continuation of this chapter is description of creating UV maps in individual steps, creating texture and lastly applying texture to the model. In the next section there are described the limitations of models production that are used in systems operating in real-time and conditions the model must meet. This section also contains a brief description of the things that you must be careful of when modeling with illustrative examples and explanation. The next chapter describes in detail model creation stages and focuses on a detailed description of actions performed. In this chapter more attention is devoted to creating maps since these give the model a realistic look. In the work there are further mentioned programs usable in creating models in each of the production parts, their main advantages, brief description of the functions and in the end of this chapter is the rationale for selection of programs used. In the last part of the thesis the models created for systems operating in real time are presented, their graphic design and specifications fulfilling all the conditions for their use in practice.

Keywords: real-time, 3D models, UV map, texture

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INTRUSION DETECTION USING RECURRENT NEURAL NETWORKS

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Abstract: Content themes of work was to analyze the possibility of using neural networks for intrusion detection. The main objective of this work is to find the appropriate network attacks, create a set that would represent the flow of data in a computer network and with those attacks, and then propose a recurrent neural network and analyze the possibility of its use in detection of intrusions in computer networks and assess whether the neural network is suitable to detect various intrusions, or not and thus if it is possible to use as the intrusion detection system. As a guide to determine whether it is appropriate recurrent neural network for intrusion detection is to analyze whether the network is capable of communicating data to distinguish between normal data flow and attacks. In conclusion, we can summarize that any recurrent neural networks were able to identify 100 percent of some attacks, while the network had 0 percent false detections. But they were also attacks that the network could not detect.

Keywords: recurrent neural network, intrusion, detection, intrusion detection system

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TAC-MAP

LIGHTWEIGHT GEOGRAPHICAL INFORMATION SYSTEM WITH IMPLEMENTED NEC PHILOSOPHY

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Abstract: Many ways have been recently introduced to display a current tactical situation. I would like to specify one of the most cost-effective methods. It generally stands on using of cheap smartphones with the Android operating system. These general purpose devices are really small, cheap, and in addition some of them are resistant enough to fulfil its mission.

This paper shortly describes the process of developing a software application with the client-server architecture and with a mobile client side useable in military. It also presents the application itself. The research deals with the areas such as working with maps, geocoding, and web services even with security.

By using Google Maps API it is possible for the client side to get map and satellite images. The client gets tactical information through SOAP web services which provide communication with the server. The server side is responsible for the management of the tactical database.

A user, after successfully logging in the application, is able to view the current tactical situation. He can easily modify NATO military symbols located on the map such as delete them or change their positions. The application framework is responsible for synchronization of all clients in the same session.

In conclusion, some plans for the future development are mentioned. The most significant is the plan for adding GPS support and improving of security of the application.

Keywords: NEC, Information, Android, GIS, JAVA 2 EE

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ANALYSIS OF THE USE OF ARTIFICIAL NEURAL NETWORKS IN CRYPTOGRAPHY

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Abstract: This paper discuss the use of neural network in cryptography. In the introduction are defined characteristics of biological neuron, artificial neuron, artificial neural networks and cryptography. The first chapter deal with artificial neural networks in Matlab, topology of neural networks and the transfer functions. The second chapter describes cryptology focusing on cryptography, encryption and types of cryptographic systems. The last chapter deal with the obtained results from the analysis of training sets, training artificial neural network and simulation artificial neural network. In the third chapter are describe graphs that represent obtained results from the training of artificial neural networks and reults from the simulation of artificial neural networks. In the conclusion are defined knowledge and insight possibility of using artificial neural networks in real systems.

Keywords: neuron, artifical neural network, cryptography

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PACKET TRACER MULTIUSER ENVIRONMENT AND IT'S USABILITY IN LEARNING PROCES

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Abstract: Rapidly evolving world of information technology demands effective ways to prepare young professionals for new challenges. This paper is exploring one of many possibilities to accomplish such goal. This particular option lies in Packet Tracer software, developed by Cisco Systems, Inc. Packet Tracer software serves as virtual learning environment and is used to teach vital skills in computer networking. It is able to simulate vast number of network devices in virtual workspace, while all of these devices are equipped with proper software and are fully connectible to each other. This allows student to practice setting and managing networks of various complexity and size. This paper focuses on one of Packet Tracer features, which is Multiuser, that allows to interconnect multiple users and supports cooperation in order to complete a common goal. My goal is to explore PT Multiuser possibilities in small network (LAN) environment and to propose and complete one teaching unit for eight students and one supervisor in order to further improve learning process effectivity. In conclusion I would like to emphasise importance of constant self-improving since without it, there would be stagnation.

Keywords: LAN, Packet Tracer Multiuser, simulation, practical learning

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INTRUSION DETECTION BY FEED-FORWARD NEURAL NETS

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Abstract: The goal was to get acquainted with the problems of artificial neural networks and describe the use of feedforward neural networks like intrusion detection system (IDS). The theoretical part deals with the neural networks, their description, history, types and methods of learning. The thesis is mainly focused on the establishment of appropriate neural network, which could work as a network IDS. The practical part deals with such a network model and its implementation in a suitable programming environment and also procedure of learning, comparison of the results obtained from the simulation, what means the neural network was tested by known data.

Keywords: Neuron, Neural network, Feed-forward neural network, Activate function, Learning, Testing, Matlab

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GENERAL COMPUTING ON GRAPHICS PROCESSORS

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Abstract: A work deals with the theoretical view on graphics processing units GPUs. Its content is the definition of video adapter and the description of its general characteristic and uses. In addition, the work provides a brief description of the architecture specification enabling the implementation of the general computing, and brief overview of the application programming interfaces for GPU too.

Keywords: video adapter, graphics card, GPU, CPU, GPGPU, NVIDIA, Tesla architecture, unified architecture, CUDA, kernel, thread, API.

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**SECTION
MANAGEMENT, ECONOMICS
AND LOGISTICS**

SLOVAK ARMED FORCES AND THEIR SHARE OF EMPLOYING YOUNG GENERATION

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Abstract: The citizens of the Slovak Republic are restlessly following the situation in the field of unemployment. The essential part of this unemployment is made of the adolescents, who after the graduation from high schools and universities relatively hardly find any profession. On the other hand, one of the potential employers are the Armed Forces of the Slovak Republic. The professionalization of the Slovak Armed Forces enabled adolescents to join for a period of time. These changes in the law related to the military service made this profession a lifelong occupation once again. Not only these changes, but even pilot projects will be able to soothe the impact of the unemployment of some groups of adolescents by allowing them to attend to voluntary military services like enlisting to active guard reserve. Of course the service in these activities would be rewarded by the exactly concluded rules. This way we can support the adolescents in receiving working habits, and not losing them. This way adolescents will be assisted to adopt working habits and not to lose touch with them.

Keywords: unemployment, human resources management, reintegration of personnel, voluntary military service, active guard reserve

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KNOWLEDGE MANAGEMENT IN CONDITIONS OF ARMED FORCES ACADEMY

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Abstract: The present paper addresses the basic theoretical foundations of the knowledge management. Detailed attention is paid to intellectual potential and its dimensions with a focus on information, data, information, knowledge and wisdom. Considerable attention is paid to the typology of knowledge, knowledge management environment and especially tacit knowledge sharing tool. At the end of the theoretical part of the paper will define the benefits and advantages of knowledge management. In the practical part analyzes the work of the research project within the AOS, where the main group targeted in the survey are students AOS. Found conclusions and recommendations for practice in the Armed Forces are provided at the end of work.

Keywords: knowledge management, intellectual capital and its dimensions, typology of knowledge, tacit knowledge sharing tools, knowledge management environment, advantages and benefits of knowledge management.

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MILITARY HISTORY OF ART FROM THE VIEWPOINT MILITARY MANAGEMENT

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Abstract: In the present work we address the issue of military art history from the perspective of military management. I concentrate on particular periods of warfare from a historical perspective (Sun Tzu, Clausewitz). The paper focuses on the period from the Napoleonic Wars to modern times. Furthermore, the paper describes the characteristics of individual commanders (leaders) at different times and their impact on military management. At the end of the theoretical part of the thesis I define the benefits and advantages for military management. Found conclusions and recommendations for practice are provided at the end of work.

Keywords: management, military management, military leader, commander, military environment management, advantages and benefits of military management.

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THE LABEL (ETIQUETTE) OF MANAGER IN ARMED FORCES OF SLOVAK REPUBLIC

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Abstract: This paper work is focused on area of social relations and etiquette in terms of Armed forces, which is now part of the professionalism of everyone. Nowadays the usages, standards and regulations, that manage our service communication and social contact, require a deep understanding a broad scientific interest of each member of Armed forces. Inevitably, this required cultivating of current and previous professional knowledge, skills and competences of young people in global environment - resort of defence without excluding.

In developing the content of this paper work, the author based on available literature and the experiences of students Armed forces academy in the area of subject Etiquette and protocol of Manager. Also she took the own opinions from members of career courses on the issue in the context of lifelong learning, in order to enhance the human respect, tactfulness, tact, self-esteem with the emphasis on courteous demeanour in area of better preparation and higher professionalism of students and military professionals in space of Armed forces of Slovak republic.

Keywords: label (etiquette) of manager, social contact, social behaviour and professionalism of members Armed forces of Slovak republic,...

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ANALYSIS OF THE PROBLEM OF ECONOMIC CRIME IN SLOVAKIA

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Abstract: First part is dedicated to the basic classification of crime, definition of crime and basic legal norms.

The second part is devoted to a deeper examination of the issues of economic crime, and the centenary associated assumptions of committing and building economic crimes.

The third part is devoted to the expression of tax crime in Slovakia, and the fourth and final section is contains the statistics of economic crimes, displayed tabular but also graphically, for the years 2013, 2012, 2011, 2010, 2008, 2005.

Keywords: economic crime, the statistics, the expression, final section

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STUDY OF THE IMPACT OF FISCAL POLICY ON NATIONAL ECONOMY

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Abstract: The paper deals with fiscal policy and its impact on national economy. Taxation is one of the areas that went through the most important changes in the last ten years; unfortunately, these changes have occurred either too slow or too fast, so that the tax was often embedded in the consciousness of taxpayers as a factor of instability in the development of countries. Taxation is vital for the public sector and the private sector. Effects are reflected in the foreign investments, national entrepreneurs and population. Fiscal policy is an indirect acting factor on economic growth, a socio-political factor like freedom of exchange, the competitive nature of markets. The economic effects of fiscal policy are best shown using the fiscal impulse indicator, as shown for Slovak Republic during 2001-2012 period.

Keywords: expansionary and contractionary fiscal policy, taxes, fiscal impulse, output gap

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STUDY REACTION ON IED STRIKE – CASE STUDY AND VERIFICATION OF SOLUTION BY SIMULATOR VIRTUAL BATTLESCAPE 2

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Abstract: Elaborated case study using Virtual Battle Space (VBS2) as the tool for verification of proposed solutions is one of approaches how to improve and enhance attractiveness of education within the University of Defence for students who are preparing for future role as a unit leader. Designed case study should check student's tactical knowledge of fighting in ambush including skills to lead fight with using command technique for leading unit by maneuver by fire and by movement. Moreover, there should be checked student's ability to use military NATO Joint Symbology included in publication APP-6(C), compile and transmit report with requirements according to NATO standards.

Part of this case study is proposal of author solution of this situation (incident) including prepared scenario for check of proposed solution in virtual environment of simulator VBS2.

Keywords: Case Study, Improvised Explosion Device, Virtual Battle Space (VBS2), simulator, tactics

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THE QUALITY OF LIFE OF INHABITANTS OF THE SLOVAK REPUBLIC

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Abstract: The daily life of the citizens of the Slovak Republic is becoming increasingly dependent on their ability to succeed in the labour market or in business, from general health, the socio-political climate in the country, but also on the particular context of civilizational advancement of technology and science. Faster than ever before there are changes in people's lifestyles, changing individual life strategies, dramatically changing the quality of life. The aim of my work is to highlight the area and at the same time to reflect on the quality of life of the inhabitants of the Slovak Republic. The first part of my work will be based on theoretical knowledge about quality of life and the second part of the work will be focused on the economics and the broader context of the phenomenon - the problems of people's living standards associated with other problems of everyday life.

Keywords: the quality of life, human development index, multidimensional poverty index, net economic welfare

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SCHEMES OF USE OF RECONNAISSANCE UNITS IN FAVOUR OF TASK FORCES (LEARNING TOOL)

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Abstract: This thesis discusses the characteristics and principles for the use of reconnaissance units operating in favor of the battalion and the brigade task forces. The work is dedicated mainly to the creation of diagrams that illustrate the principles of using reconnaissance units in favor of the battalion and brigade task forces. The schema file is processed in the form of presentation of the MS Power Point, to be usable by the widest possible range of users, from the ranks of University Of Defense and other members of the ACR. This work is the original tool and it is possible to use it as a teaching tool for students and staff of the University Of Defense (UOD). At the same time is fully usable in military practice in the ACR.

Keywords: Military symbology, schemes, battalion task force, schema set, principles in creating of tactical symbols, use of tactical symbols, NATO joint symbology, APP-6c, learning tool.

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STORAGE AND HANDLING OF FUEL IN THE SLOVAC ARMED FORCES

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Abstract: The paper is focused on the characteristics of the storage and handling of fuel in the Slovak Armed Forces. Topic of work is very up-to-date, because the service of fuel is an integral part of the combat service support units in peace and in the field. Fuels are still necessary for the function of the vehicles (their engines) until the oil reserves run out. For this reason, experts in the field of service of fuel are needed in each fuel storage facilities. And for their effective function and performance of their specialization, they need to know at least the basic principles and measures for storage and handling with fuel. It means that they should be knowledgeable in the income and spending of fuel, saving fuel and replacement of the fuel, transport fuel and economical use of fuel material.

The work is divided into three chapters. In the first is attention given to terminology related to service of fuel and to definition of this service, in second chapter are presented the principles of storage of fuel and in third chapter is mentioned handling with fuel and basic safety rules for handling with fuel.

Keywords: storage, handling, service of fuel, stores, security rules, storage management.

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**SECTION
SOCIAL SCIENCES
NATIONAL AND INTERNATIONAL SECURITY**

THE INTERNATIONAL BALANCE OF POWER IN THE YEAR 2050 (SECURITY IMPLICATIONS)

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Abstract: The project aims at applying qualitative and quantitative methods to create a model of the international balance of power in 2050. This allows to create more accurate forecasts of future security environment development and its implications. For the purpose, the authors use a computational model developed by Professor Mirosław Sulek, the Polish pioneer of powermetrics research. Fundamentals of the interdisciplinary model can be found in international relations theories, security studies methods, cybernetics and physics. The authors are directly involved in developing this field of research and their intention is to share initial results of their work.

Key words: Powermetrics, International Balance of Power, Power, Sulek's Model

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COMPLEX ANALYSIS OF AIR TRAFFIC CONTROLLERS'S FUNKTIONAL CONDITION AND WORKING CAPABILITY, AND IT'S SIGNIFICANCY IN SELECTION AND TRAINING

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Abstract: My essay's aim is to monitor and analyse air traffic controllers's working capability and functional condition. The main topic of the essay is the presentation of functional condition monitoring methods, and how they can be applied to analyse military activities, mainly focusing on air traffic controllers.

The system of air traffic control is very complex, that's why it is necessary to specify the partition of air traffic services. Every service has it's own responsibility and function. The primary objective of functional condition analysis is to determine the momentary phisical and mental condition, which assigns the subject's performace at the given moment. Only who possesses a certainset of skills and knowlege is fit to execute a specific activity, without health impairment and mental distortion.

The ATS's have a standardized condition analysis system, and it analyses the mentioned factors colletively.

The essay also includes a method which was not used so far for monitoring air traffic controllers: heart rate variability analysis. Heart rate variability shows the heart's momentary condition and it's reaction to different situations in correlation with heart pulse. Therefore it shows the subject's health condition.

The main reasons why I choose heart rate variability analysis were: it is inexpensive, it's non-invasive and still gives complete report on the condition of air traffic controllers. In my opinion heart rate variability analysis can serve as a new method in analysing air traffic controllers with the advantage of the executability of conducting the monitoring during their work. Overall this can aid controllers to develop professionally.

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CAUSES AND EFFECTS OF THE 2014 UKRAINE CRISIS

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Abstract: Actual events in Ukraine are consequence of the prolonged political and economic crisis, but they can be observed from numerous stand points. This paper will analyse how joint Ukraine – Russian history and ethical cohabitation combined with the geopolitical positioning of the Ukraine influenced the crisis development. On this aspect, paper will add the burdens of Ukraine political instability of the past decade brought with and after the Orange revolution. Economic situation could not be ignored in the conflict analysis, as the trade relations with Russia and dependency on the Russian energy resources are of strategic importance in any decision-making for the Ukraine future. Ukraine, as the country of the inadequately used economic potentials, aged infrastructure and lack of foreign investments, became an “easy target” for the interventions of the foreign actors such as Russia, EU, NATO, US or MMF. Their role in the conflict will be touched upon as well. In the end, this paper will look into the military and security forces balance of power in the region. Post conflict reconstruction of the state institutions and recovery, cannot begin for as long security and stability are shattered in the light of the continuous pro-Ukraine and pro-Russian militant forces. Even more, there is a real danger that, unless quickly contained, this conflict could pour over the Ukraine borders and destabilize the whole area. Only the joint readiness of all sides involved will enable in which direction Ukraine will move next.

Key words: the Orange Revolution, economic and political crisis in Ukraine, Ukrainian-Russian ethnic divisions, Crimea annexation

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REVITALIZATION OF THE AIR BASE FOR THE UNMANNED AERIAL VEHICLES

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Abstract: Contemporary security trends in Europe indicate rising trend of the unmanned aerial vehicles (UAVs) usage, not only for the military purposes, but also for wider spectrum of security tasks (such as control of the outer European borders, fight against organized crime, and oversight of the main migration routes ECT.). UAVs can be designed to conduct diverse number of functions and tasks – from combat and reconnaissance, to logistics and transport. They are easy to use, hard to detect, easy to maintain, their deployment and possible failure are of no consequence for the human operator, as it's still far more acceptable to lose an UAV then the single soldier in combat. In support of these trends, Republic of Croatia is studying the possibility to specialize existing air base in „Josip Jović“ barracks in Udbina, for the UAVs use. This paper will show current European policies on UAV use and possibilities offered by Croatian bases.

Keywords: European security, security policies on the UAVs, unmanned aerial vehicles, “Josip Jović” barracks in Udbina

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CYBERWARFARE AND INFORMATION SECURITY

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Abstract: Cyberspace has become a part of our everyday life. Without internet access in our society today we can not work. Meanwhile, cyberspace has become a new domain of the battlefield, as the land, the air, the navy or the information. Cyberwarfare represents a novel weapon that has the potential to alter the way state and non-state actors conduct modern war. The unique nature of the threat and the ability for cyberwar practioners to inflict injury, death, and physical destruction via cyberspace strains traditional definitions of the use of force. This paper focuses on the relationship between the cyberwarfare and information security. I have presented some cyberweapons, the most important cyber attacks against some countries and some information about cyber terrorism.

Keywords: Cyberspace, Malware terminology, Cyberwarfare, Cyberterrorism

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SECURITY THREATS CHANGES' INFLUENCE ON COMBAT MACHINERY DEVELOPMENT

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Abstract: Everything that surrounds us can be characterized by one feature common to them all. This feature is called development by the time and space changes and as the history shows, military is no exception. We currently live in a rapidly changing society, where you have two choices – to adapt and change yourself or to become extinct.

According to this “rule” the military, as the defending force of the nation, is being obliged to readapt its skills, abilities and equipment to new security threats, that issue from the new geopolitical situation. Considering our region, there changes are very dramatic as well. We have been part of one of the greatest military and political pacts for more than forty ears and now it is only few weeks ago we remembered the 10th anniversary of our membership in the North Atlantic Treaty Organisation as a most powerful counterpart of the Eastern Block. The security threats for us rooting from our membership in this organisation are diametrically different from those we faced for the mentioned forty years and our military had to adapt to this change as well.

As I mentioned, this adaptation process can be clearly demonstrated by an example of the changes in tactics, equipment and armament of the military following the request to fulfil all the security needs stated. And this project gives me an excellent opportunity to explain this problem by an example of the APC's (Armoured Personnel Carrier) development, that is currently being solved by an experts of our engineering industry.

Keywords: development, security, threat, adaptation, involvement, geopolitical situation, military tasks, armament, change, defence

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DEFENSIVE ACTIVITIES OF SMALL TACTICAL UNITS IN BUILT-UP AREAS

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Abstract: This submission into the student scientific conference includes elaboration about the issue of the urban environment on conducting defensive activities of small tactical units. In first chapter one can find aims and methods used during the elaboration of submission. In the second chapter one can find brief historical development of urban combat and reasons, which clarify the importance of military operations in urban environment. In the last chapter issues considering defence in urban environment are being solved. This final chapter considers mainly about preparation of defensive activities, which includes cooperation with combat support and combat support services. Due to the growing urbanization of the world it is certain that the military operations conducted within the urban environment are going to constitute a key component of all operations.

Keywords: build-up areas, three block war defensive operations, small tactical units, military operations in the urban areas

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CHANGES OF MOTIVATION FACTORS OF THE CADETS AND PROFESSIONAL SOLDIERS TO SERVE IN THE ARMED FORCES OF SLOVAK REPUBLIC

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Abstract: The goal of the submitted work is identification of motivation factors which influence young people in joining the Armed Forces of Slovak Republic and in their interest to study at the Armed Forces Academy of General Milan Rastislav Štefánik. The survey was conducted among cadets of the first and third year of study, as well as among soldiers who serve in the military for five years and more years and currently are undergoing career courses. The results of our survey are compared with the results of other surveys which were conducted by the Center of psychological and sociological activities of the Staff Office of the Armed Forces of Slovak Republic regarding motivation issues and job satisfaction of soldiers.

Keywords: Motivation. Job satisfaction. Cadet. Military professional. Military work.

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WITH WEAPONS, WITHOUT DREAMS

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Abstract: What kind of reasons would drive a person under the age of 18 to join an armed force? Why are they welcomed by not only the different militias, but by also some governments too? In my study I examine the phenomenon of child soldiers. Unfortunately, the extent of this essay is too short to provide a thorough analysis of all the related legal norms. However, I attempt to bring forward some answers to the following important questions: is a child with a gun in his hand a legitimate target? Is he punishable for committing war crimes? As a part of my study, I take a close look at some cases that are already closed and some that are still in progress at the International Criminal Court or the Special Court of Sierra Leone against commanders and warlords for using child soldiers.

Keywords: child soldiers, war crimes, responsibility

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COUNTERINSURGENCY, FIGHTING WITH A GIANT IN A DWARF WAR

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Abstract: Nowadays, the security environment is facing an increasing number of asymmetric warfares, in which the insurgency is distinguished as being the most complex and violent action. Therefore, this paper aims to present the counterinsurgency. Counterinsurgency (COIN) may be defined as 'comprehensive civilian and military efforts taken to simultaneously defeat and contain insurgency and address its root causes'.

In the first part of this paper, I will present some definitions for insurgency and for counterinsurgency and also present some general aspects about these two terms. After this I will focus just on the counterinsurgency operations, presenting the laws of these operations, some characteristics of the operations and also some paradoxes of the COIN operations. In the end there will be a short presentation about the soviet war in Afghanistan in which will be revealed the biggest mistakes made by URSS in this conflict which led to their defeat.

Key words: insurgency, counterinsurgency, Afghanistan war

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FORMATION AND DEVELOPMENT OF MISSION COMMAND

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Abstract: This article defines basic terms of the command and control and decision making process. The decision making process is defined as an ever repeating cycle of observation – orientation – decision – action. The article also defines the meaning of manoeuvre approach, which is disrupt cohesion of enemy. Finally, the article describes mission command as a concept of command and control, the history and development of mission command and main features.

Keywords: command and control, decision making process, observation, orientation, decision, action, manoeuvre approach, mission command.

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