Ministry of Education and Science of Ukraine
National Aviation University

TRANSPORT VEHICLES OPERATION PART VIII: SUBJECTIVE PREFERENCES OPTIMALITY

SELF-STUDY METHOD GUIDE

Part VIII

For the Students of the
Field of Study 27 “Transport”
Specialty 275 “Transport Technologies”

Kyiv 2023

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А992

Compiler *A. V. Goncharenko*

Містять декілька рекомендацій для самостійної роботи щодо застосування знань отриманих при проходженні дисципліни «Експлуатація транспортних засобів», що є необхідним для виконання робіт індивідуального завдання, підготовки до складання заключних видів контролю.

Для студентів 2-го курсу галузі знань 27 «Транспорт», спеціальності 275 «Транспортні технології (на авіаційному транспорті)».

А992 **Transport Vehicles Operation. Part VIII : Subjective Preferences Optimality** : Self-Study Method Guide . Part VIII / compiler: A. V. Goncharenko. – K. : NAU, 2023. – 64 p.

The **METHOD GUIDE** contains a few recommendations on the Self-Study in regards with the application of the knowledge acquired at the study of the Academic Subject “Transport Vehicles Operation” carrying out, which is indispensable to complete the works of the individual task, get ready for passing the final kinds of the check.

Designed for the 2nd year students of the Field of Study 27 “Transport”, Specialty 275 “Transport Technologies (by Air Transport)”.

CONTENTS

INTRODUCTION

This **METHOD GUIDE ON THE SELF-STUDY** (SS) is contemplated as an ideological continuation of **PART I-VII:**

[263]: **"Transport** Vehicles Operation. Part I : Number of Transport Vehicles : Self-Study Method Guide . Part I . Number of Transport Vehicles . Optimal Choice Dilemma / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2022. – 48 p. https://er.nau.edu.ua/handle/NAU/56234, Method_Guide.pdf."

[275]: **"Transport** Vehicles Operation. Part II: Elementary Supply Chain Optimization : Self-Study Method Guide . Part II / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 53 p. https://er.nau.edu.ua/handle/NAU/62062, II_TVO_SSG.pdf."

[276]: **"Transport** Vehicles Operation. Part III : Elementary Optimal Supply Speed : Self-Study Method Guide . Part III / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 53 p. https://er.nau.edu.ua/handle/NAU/62139, III_TVO_SSG.pdf."

[277]: **"Transport** Vehicles Operation. Part IV : Optimal Number of Transport Vehicles : Self-Study Method Guide . Part IV / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 57 p. https://er.nau.edu.ua/handle/NAU/62141, IV_TVO_SSG.pdf."

[278]: **"Transport** Vehicles Operation. Part V: The Simplest Problem of the Probability of a Choice : Self-Study Method Guide . Part V / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 54 p. https://er.nau.edu.ua/handle/NAU/62159, V_TVO_SSG.pdf."

[279]: **"Transport** Vehicles Operation. Part VI : The Simplest System Reliability : Self-Study Method Guide . Part VI / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 55 p. https://er.nau.edu.ua/handle/NAU/62201, VI_TVO_SSG.pdf."

[280]: **"Transport** Vehicles Operation. Part VII : The Simplest Random Process : Self-Study Method Guide . Part VII / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 61 p. https://er.nau.edu.ua/handle/NAU/62243, VII_TVO_SSG.pdf."

in response to the needs of our students in more detailed elaborations concerning the **TRANSPORT VEHICLES OPERATION** (TVO) tasks stated, set, or given for the students' independent work on this **ACADEMIC SUBJECT** for the specified **CALCULATION AND GRAPHIC PAPER** (CGP), possibly used in their further educational works, such as their **TERM PAPERING** (TP), **COURSE PROJECTING** (CP), further **GRADUATION PAPERS** or even **PH.D. STUDIES.** The whole material is split into portions. Each portion is intended to cover a fraction of the probable applications aimed at the **TRANSPORT TECHNOLOGIES** (TT) (by **AIR TRANSPORT** (AT)), particularly dealing with the

TRANSPORTATION ORGANIZATION AND MANAGEMENT ON TRANSPORT (TOMT) for AT. It means AT management in operation possibly including some **AIRCRAFT** (A/C) technical operation issues in regards with the **AERONAUTICAL ENGINEERING** (AE) **MAINTENANCE** (M/T), as for example, in aviation business.

The presented in the eighth part, **PART VIII,** of the **METHOD GUIDE ON THE** SS assignments are dedicated, and a special attention is drawn here, to the general aspects of the SS work for the TVO practical works, individual task, final kinds of the check, future students' prospective research and scientific publications as well as conference reports and presentations.

The scientific component of the SS work is very important. That is why, specifically, the objectives of the **PART VIII** material are to help students cope with the challenging problems relating to the studied **ACADEMIC SUBJECT** of TVO on the AT management in operation, for instance, A/C technical operation in regards with the aeronautical engineering M/T as well as the **AIRCRAFT AIRWORTHINESS** support measures.

The set of the considered issues is based upon the **RECOMMENDED LITERATURE SOURCES** (the list is presented, but not limited to it). The **LIST OF LITERATURE** at the end of the **METHOD GUIDE** is basic (major) and compiled partially not only in the alphabetic order, but mainly with respect to the matter of supposed (assumed) importance.

The **REFERENCES LIST** is selected, set in the order [1-280], does not pretend for completeness, but instead it is aimed at developing the students' abilities of thinking and to analyze, contemplate in the specified directory rather than their abilities to know and memorize. However, these are very significant too. Actually, in the contemporary informative boom world, the needed or required data can be easily retrieved from the internet, found in multiple references, guidance materials [1-23], studies, dictionaries, comprehensive books, publications and scientific papers like [24-280] amongst those monographs [9, 90, 108, 121, 198, 201, 206] etc. The **METHOD GUIDE** is designed for the 2nd year students (**BACHELOR'S DEGREE** contenders) in the Field of Study: 27 "Transport", Specialty: 275 "Transport technologies (by air transport)", Specialization: 05 "Air Transportation Management". The considered studied academic subject of TVO finalizes the previous education in the Field of Study: 27

"Transport", Specialty: 275 "Transport technologies (by air transport)", (**BACHELOR'S DEGREE** contenders); plus of the 1st year students (**BACHELOR'S DEGREE** contenders) in the Field of Study: 27 "Transport", Specialty: 275 "Transport technologies (by air transport)", Specialization: 05 "Air Transportation Management". There are a lot of the planned academic subjects in the **BACHELOR'S** and **MASTER'S DEGREE CURRICULA (CURRICULUMS)** related to the considered studied academic subject of TVO.

This very special eighth part, **PART VIII,** of the studied academic subject of TVO is aimed at the **MATHEMATICAL SETTING OF THE PROBLEMS** considered in the CGP on TVO, with the possibilities of the further development to education work, such as, course projects, even up to the graduation papers, **BACHELOR'S** and **MASTER'S DEGREE GRADUATION WORK,** or even Ph.D. studies. Therefore it is strongly suggested for the students to agree their own envisaged course projects, **BACHELOR'S** and **MASTER'S DEGREE GRADUATION WORK THEMES** and prospective research areas with their **SUPERVISORS**.

The scientific portion of the students' SS work might prolong the initiated at the preceding stages of the **BACHELOR'S DEGREE** contending study. It includes the **students' SS research results publication in scientific journals and scientific conferences proceedings**. In the prospect such kinds of the students' activity may lead to a successful defense of the **GRADUATION WORK** or a successful passing the **FINAL STATE EXAMINATION;** as well that may lead to a successful passing of the **UNIVERSITY PH.D.'S DEGREE PROGRAM ENTRANCE EXAMINATION.** The other benefit of the research results publication may be, for example, in the detailed solutions for obtaining the optimal distributions of transportation means: [263, 277], their combinations, optimization of the supply chain links: [275], and supply speeds: [276], probability of a choice: [278], the simplest system's reliability: [279], reliability objective measures: [280], allowing assessing the improvements of the A/C functional system M/T process considered in references [138-140].

Herewith it is proposed to continue the search for the detailed solutions for the examples considered in the references of:

[194]: **"Goncharenko A. V.** Multi-optional hybridization for UAV maintenance purposes / A. V. Goncharenko // 2019 IEEE 5th International Conference "Actual Problems of Unmanned Aerial Vehicles Developments (APUAVD)" Proceedings. – October, 22-24, 2019, Kyiv, Ukraine. – 2019. – pp. 48-51.**"**

[182]: **"Goncharenko A. V.** Relative Pseudo-Entropy Functions and Variation Model Theoretically Adjusted to an Activity Splitting / A. V. Goncharenko // 2019 9th International Conference on Advanced Computer Information Technologies (ACIT'2019). – June 5-7, 2019. – Ceske Budejovice, Czech Republic, 2019. – pp. 52-55."

[71]: **"Goncharenko A. V.** Measures for estimating transport vessels operators' subjective preferences uncertainty / A. V. Goncharenko // Scientific Bulletin of Kherson State Maritime Academy. – 2012. – № 1(6). – pp. 59-69."

Completion of CGP is an independent / individual student's work of a creativeness.

The essential sections of the student's report of the CGP completion are:

Introduction;
Literature survey;
Theoretical background;
Major dependencies;
Statistical data;
Student's own contribution;
Derivations;
Findings;
Calculations;
Plotting diagrams;
Analysis;
Discussion;
Conclusion;
References;
Other necessary parts (significant results).

The time required for CGP completion is about 10 academic hours.

The length of the report for the about 10 academic hours completion work is up to 5 pages.

For the **PANDEMIC QUARANTINE PERIOD,** especially **MARTIAL LAW,** it possibly might have the corrections in the **ORDER** of the SS on TVO carrying out.

The general control for the SS on TVO performance is realized (amongst others) through the corresponding **GOOGLE CLASS ROOM.**

Thus, dear students, get down to this challenge to demonstrate your own creativity!

GENERAL PROVISIONS

The principal theoretical provisions can be found out in references [1-23].

1. Planned hours

According to the **TRAINING PROGRAM** on the **ACADEMIC SUBJECT** of the considered TVO and depending upon the particular academic hours specified for the training and study, the entire **SUBJECT** may contain up to many hours.

According with the **TIME TABLE, PROGRAM,** and **CURRICULUM,** regularly approved by the **UNIVERSITY RECTOR'S ORDER,** it figures out like following:

17-19 (optionally 18) weeks of the **SEMESTER WORK,** including some days for the **MODULE TESTS** or the **CGP DEFENSE,** final **GRADED TEST CHECK.**

Thus, it all usually makes a **SEMESTER** weeks **PERIOD.**

Regularly, there might be **2 SHIFTS** that are planned for the **STUDENTS.**

Namely:
The **1ST SHIFT** starts at 8:00;
The **2ND SHIFT** starts at 15:20.

For the **SOPHOMORIC STUDENTS** it is usually the **1ST SHIFT;** and for the not large groups it is just **COMMON LABORATORY CLASSES**, without dividing the groups into **HALVES (SUBGROUPS).**

Therefore, duration is 2 (4) academic hours a week for each **STUDENT** of a group on the day of the **LECTURE DELIVERY** and **LABORATORY CLASS CONDUCTION.** Totally it makes up to 30-40 academic hours of **AUDITORIUM WORK** for the entire considered studied academic subject of TVO. Then, it is plus about up to two thirds

of SS (up to 100 academic hours) including up to 30 academic hours for CGP. As whole it may have variations.

As a rule, the information on the **TIME TABLE, PROGRAM,** and **CURRICULUM,** and **TOPICS** are provided at the **AIR TRANSPORTATION MANAGEMENT DEPARTMENT** on the **INFORMATION BOARD (DESK)**; as well as, it can be displaced at the corresponding **GOOGLE CLASS ROOM** and/or the **DEPARTMENT WEBSITE (PAGE), UNIVERSITY REPOSITORY PAGE** etc.

For the **PANDEMIC QUARANTINE PERIOD,** especially **MARTIAL LAW,** the general control for the CGP performance is possible (amongst others) through the corresponding **GOOGLE CLASS ROOM.**

2. Subject content

This step is very important too.

The mentioned above 18 (16) weeks of the Semester study **STUDENTS' WORK** (accordingly with the **TIME TABLE)** are, or might be, subdivided into **COMMON AND INDIVIDUAL TOPICS**:

1.1. Organizational meeting. Instruction on labour protection and fire safety.
1.2. Common aspects of the General Approaches.
1.3. Individual Tasks relations to the chosen research areas.
1.4. Correspondence with the Final Work theme.
1.5. Appropriate methods of the research.
1.6. Mathematical Apparatus for the objectives.
1.7. Mathematical formulation of the conceptual provisions.
1.8. Experimentations.
1.9. Statistical Data processing.
1.10. Analysis of the obtained preliminary results.
1.11. Choice of the corrective methods and ideas.
1.12. Analysis of the use of the corrected methods research results.
1.13. Implementation into the Final Work.
1.14. Prospects of the research results application.
1.15. Publication of the research results.

These **TOPICS** might also be provided at the **AIR TRANSPORTATION MANAGEMENT DEPARTMENT** on the **INFORMATION BOARD (DESK)**; as well as, they can be displaced at the corresponding **GOOGLE CLASS ROOM** and/or **UNIVERSITY REPOSITORY PAGE.**

There is one major document that the student must prepare: CGP **REPORT**. The **REPORT** of the CGP is discussed at the corresponding following **SECTIONS** of this SS **METHOD GUIDE.**

After this **PROGRAM** on CGP completion, and having done and submitted the own **REPORT,** every **STUDENT (AUTHOR)** is supposed attempting to pass the

DEFENSE AND GRADED TEST

The ***DEFENSE*** is going to be discussed further on in this SS **METHOD GUIDE.**

And the best way of the CGP completion is the **SCIENTIFIC PUBLICATION,** which also will be instructed down here in the presented SS **METHOD GUIDE.**

Theoretical material for the CGP tasks is based upon references [1-280]. The idea is traced from the comparatively newest (latest) books [4, 5, 9, 13-17], **NATIONAL PROVISIONS** for aviation business in compliance with the **IATA, EASA,** continental, normative documents, and **ICAO** requirements like in [14]. Some convenient aspects of the subject learning are in the TOMT for AT, TT (by AT), **DIRECTIVES ON TECHNICAL OPERATION,** A/C and AE M/T, referred to in [14].

For the **PANDEMIC QUARANTINE PERIOD,** especially **MARTIAL LAW,** the general control for the CGP performance is possible (amongst others) through the corresponding **GOOGLE CLASS ROOM.**

SUBJECTIVE PREFERENCES OPTIMALITY BASED UPON THEIR ENTROPY

The principal theoretical provisions can be found out in the references [1-23] and other literature sources and informational resources. Especially in monographs [9, 90, 108, 121, 198, 201, 206].

The directions of the CGP work and their completion are reflected in the series of problems offered to be considered, set, and solved.

1. Basic theoretical provisions

The most number of the transport vehicles operation problems is relevant to the individuals' subjective preferences distributions. The theory is based upon the subjective entropy maximum principle introduced by Professor Kasianov V. O., National Aviation University, Kyiv, Ukraine, [9].

Such approach, as subjective analysis is applicable to the air transportation technologies problems since none of the technologies are realized by themselves. They are the result of the responsible managerial personnel's decisions making on the ground of the involved persons' individual (subjective) perception, assessment (evaluation, estimation), comparison etc. of the considered air transportation technologies effectiveness and investigations conducted to the technologies' elements advantages and disadvantages as well.

It is absolutely clear that the above mentioned decision making process in going on in a specifically coming out circumstances characterized with the more or less degree of the various types of uncertainties.

The traditional measure of the uncertainty degree is the entropy, which takes into account, amongst others, and the very essence of the diversities.

The subjective entropy maximum principle claims the maximum of the objective functional, [9], i.e.

$$\Phi_{\pi} = \alpha H_{\pi} + \beta\varepsilon + \gamma\mathscr{V}, \qquad (7.1)$$

where Φ_π is the objective functional, either consciously or subconsciously solved by the air transport vehicles operation provider, in order to ensure the best, in some respect, air transportation technologies; π are the decision making individuals' subjective preferences functions that take into account the decision making responsible managers psycho-mental cognitive properties; α is a model (7.1) element that features the cognitive parameter of the responsible for the decision making individuals' psych (cognitive attitude to the air transport technologies management subjective preferences system distribution) in regards with the entropy H_π (subjective entropy) of the subjective preferences functions π of the achievable air transport technologies managerial alternatives, via technical, economical, political, social etc. factors, for example; β is one other cognitive parameter of the subjectively estimated value of ε comprising the aspects related to both objective and subjective nature of the operational uncertainty treatment; ε is the subjective function of efficiency; γ is one more cognitive parameter of the subjective psych concerning the normalizing condition of $\mathscr{N}$ for the subjective preferences functions of π.

Being deemed a non-zero magnitude values, the parameters of the α, β, and γ weight coefficients (Lagrange uncertainty multipliers, cognitive estimates) allow reduction with respect to one of them making the whole notation be more compact:

$$\Phi_\pi = H_\pi + \beta\varepsilon + \gamma\mathscr{N}. \tag{7.2}$$

Thus, the expression of (7.2) compared to (7.1) is reduced by α; and β and γ of (7.2) must be read as the relative to α parameters. Although, for the perceptional ease and derivation treatment conveniences, there, in (7.2), figuring purely β and γ, no modification in their designations, depictions are just the same but the meaning difference is emphasized above.

The first member of (7.1) and (7.2) is the subjective entropy: H_π, given by the following traditional (Shannon) type formula of entropy, i.e., [9]:

$$H_\pi = -\sum_{i=1}^{N} \pi_i \ln \pi_i, \tag{7.3}$$

where N is the number of the air transport technologies attainable alternatives taken into consideration.

The second member of (7.1) and (7.2) is the subjective effectiveness function: ε, which structure significantly determines the sought solution and is essential for the preferences functions optimal expressions formation.

The subjective effectiveness functions: ε, can be constructed in various ways highlighting the importance of the specific values and their interrelationships in the framework of the stated, set, and solved problems of the air transport technologies and the air transport vehicles operation through the entropy conditional optimization.

As the applicable formulas for the subjective effectiveness function: ε, of the air transport technologies achievable alternatives, it can be proposed the following expressions:

$$\varepsilon(\pi_i, F_i) = \sum_{i=1}^{N} \pi_i F_i \,, \tag{7.4}$$

where F_i is the considered achievable alternatives effectiveness functions (reckoned with as the objective rather than subjective values).

At last, the third member of the objective functionals of (7.1) and (7.2) is the assumed normalizing condition of

$$\sum_{i=1}^{N} \pi_i = 1 \,. \tag{7.5}$$

The measure of the described uncertainty reflects the entropy (uncertainty) of the individuals' subjective preferences functions: π_i, of the attainable alternatives.

Substituting the defined, by the mentioned above formulae of (7.3)-(7.5), expressions for their values into (7.2), one obtains the following view objective functional:

$$\Phi_{\pi} = -\sum_{i=1}^{N} \pi_i \ln \pi_i + \beta \sum_{i=1}^{N} \pi_i F_i + \gamma \left[\left(\sum_{i=1}^{N} \pi_i \right) - 1 \right]. \tag{7.6}$$

2. Canonical solution to the objective functional

Solving the objective functional of the (7.6) view means in accordance with the (7.6) extremum existence necessary conditions

$$\frac{\partial \Phi_{\pi}}{\partial \pi_i} = 0 . \tag{7.7}$$

Implementation of the (7.7) conditions to the (7.6) objective functional gives the so-called canonical distribution of the individual's subjective preferences functions: π_i, i.e., [9]:

$$\pi_i = \frac{e^{\beta F_i}}{\sum_{j=1}^{N} e^{\beta F_j}} . \tag{7.8}$$

If the alternatives effectiveness functions of F_i, figuring in (7.4), (7.6), and (7.8) in the explicit view, and, all over herewith, through and through in the latent (inexplicit, generalized) view, are some defined functions of some independent variable x i.e. there are the alternatives effectiveness functions as of $F_i(x)$, the solution equation of (7.8) becomes like the following, [9]:

$$\pi_i(x) = \frac{e^{\beta F_i(x)}}{\sum_{j=1}^{N} e^{\beta F_j(x)}} . \tag{7.9}$$

Therefore, the solution preferences functions: $\pi_i(x)$, of (7.9) are the functions of the same independent variable x.

From (7.1)-(7.9) one can analyze the optimal solution with respect to the uncertainty of the operational situations, the air transport technologies diversities, and the air transport vehicles operation alternatives. It depends upon some parameters. Their values are up to the students.

3. Numerical simulations

The illustration to the graphical representation is based upon the Mathcad calculation platform.

The magnitudes of the values have a certain conventional (some conditional) measurement units (dimensions).

The students are supposed to set the correspondence.

At the given F_i (shown in Fig. 7.1) and β values, the results of the simulations for the individual's subjective preferences functions: π_i, are presented in Fig. 7.2 in correspondence.

From the comparison of the images portrayed in Fig. 7.1 and Fig. 7.2 it is visible that the proportions between effectiveness and preferences of the attainable alternatives differ.

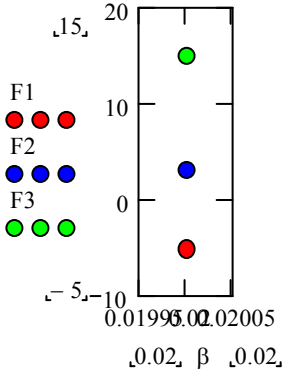

Fig. 7.1 – Effectiveness of the alternatives

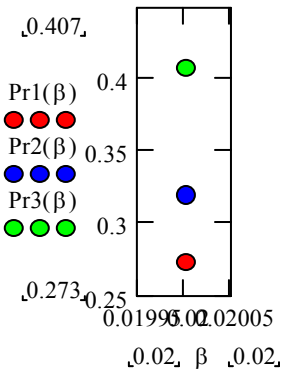

Fig. 7.2 – Preferences of the alternatives

Having the parameter of β varied, it is possible to make it noticeable that the changed value of β influences the solution significantly. The results of such modeling are shown in Fig. 7.3.

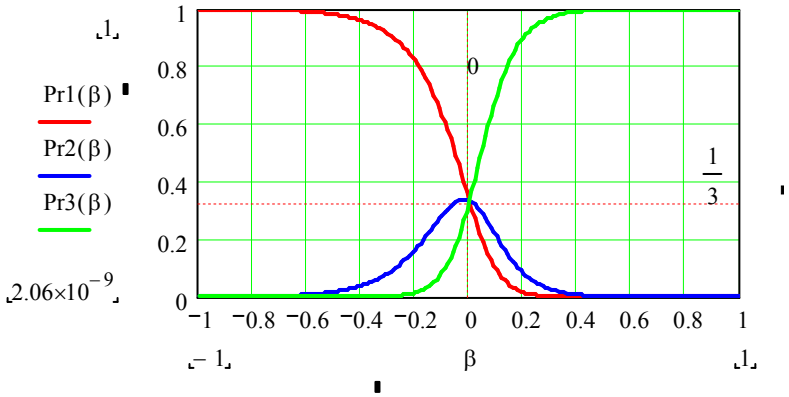

Fig. 7.3 – Preferences of the alternatives

From the Fig. 7.3 diagrams one can conclude that the close the absolute value of β to zero i.e.

$$|\beta| \to 0, \tag{7.10}$$

the less difference have the considered alternatives in the view of their subjective individual's assessment taken as the preferences functions.

Exactly, at the value of

$$\beta = 0, \tag{7.11}$$

the preferences of (7.8) and (7.9) either have the same value of

$$\pi_1 = \pi_2 = \pi_3 = \frac{1}{3}, \tag{7.12}$$

(see Fig. 7.3) which delivers the maximal value to the subjective entropy of (7.3) illustrated Fig. 7.4.

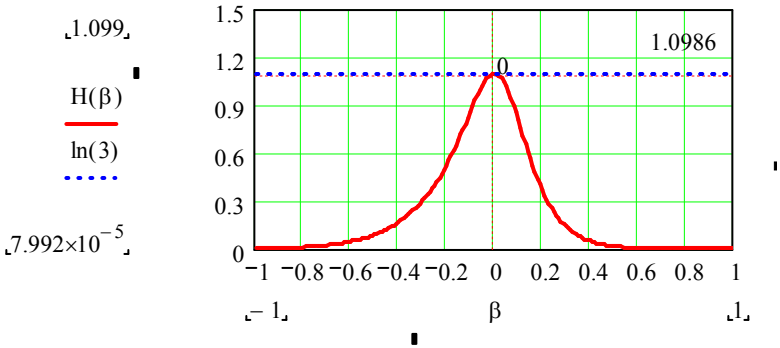

Fig. 7.4 – Entropy of the individual's subjective preferences of the alternatives depending upon the cognitive parameter and influenced upon by the effectiveness of the alternatives

4. Alternatives effectiveness functions dependencies

For the simplest view, linear dependencies of $F_i(x)$, represented in Fig. 7.5, the solution preferences functions: $\pi_i(x)$, of (7.9) as the functions of the only and the same independent variable x are shown in Fig. 7.6-Fig. 7.9.

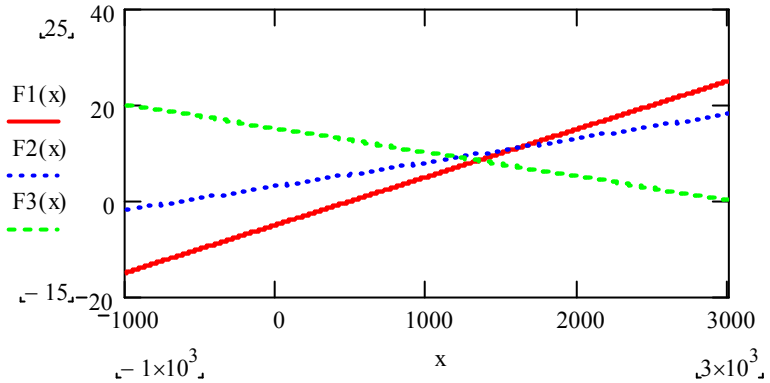

Fig. 7.5 – Effectiveness functions of the alternatives as the functions of the only and the same independent variable

The picture given in the diagrams of Fig. 7.6 is informative in the sense of all three individual's subjective preferences functions presented there. A clearer view is presented separately for the individual's subjective preferences functions in Fig. 7.7-Fig. 7.9.

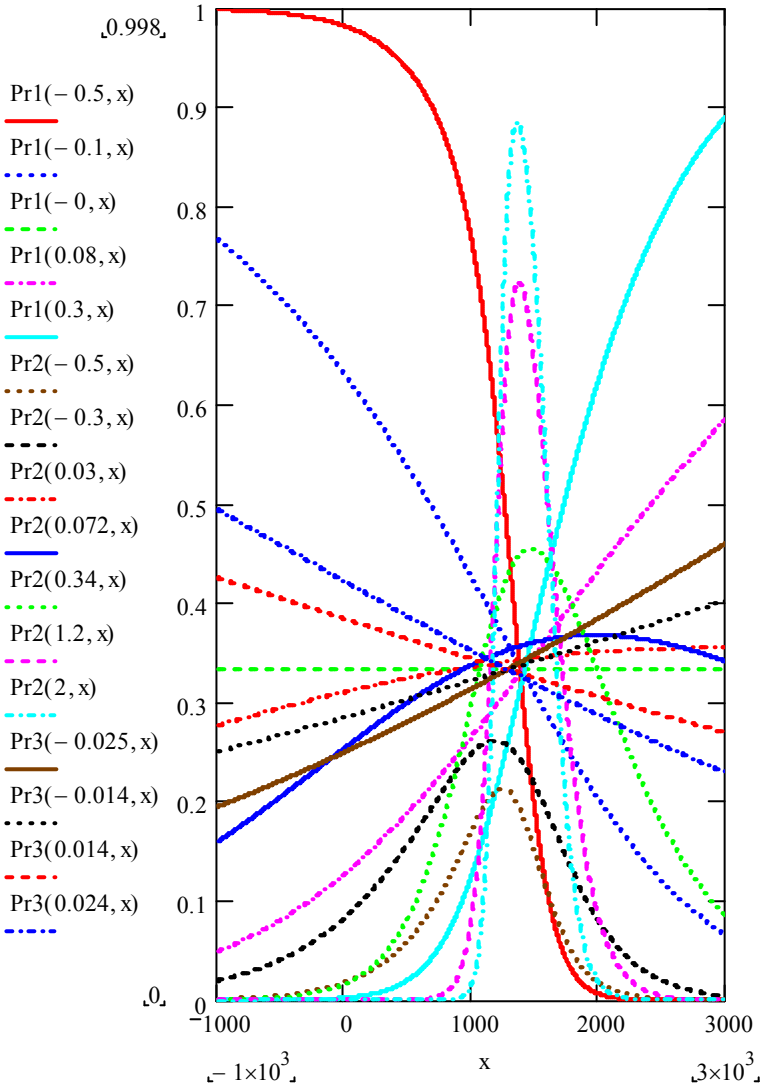

Fig. 7.6 – Preferences functions of the alternatives as the functions of the only and the same independent variable at the different cognitive parameter values

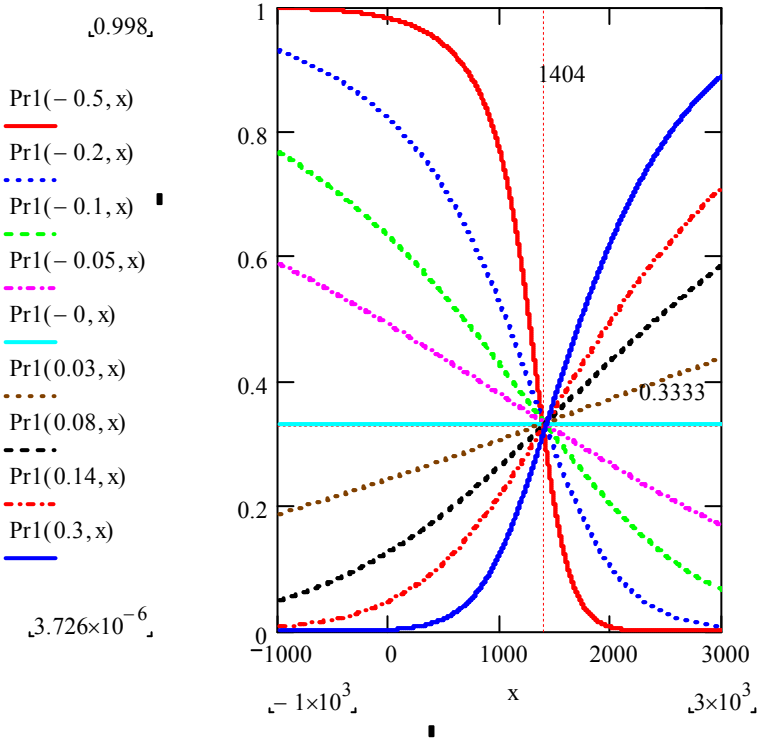

Fig. 7.7 – Preferences functions of the first alternative as the functions of the only and the same independent variable at the different cognitive parameter values

The diagrams in Fig. 7.7 are plotted in order to illustrate the behavior of the first alternative individual's subjective preferences functions at the same independent variable and the changed cognitive parameter.

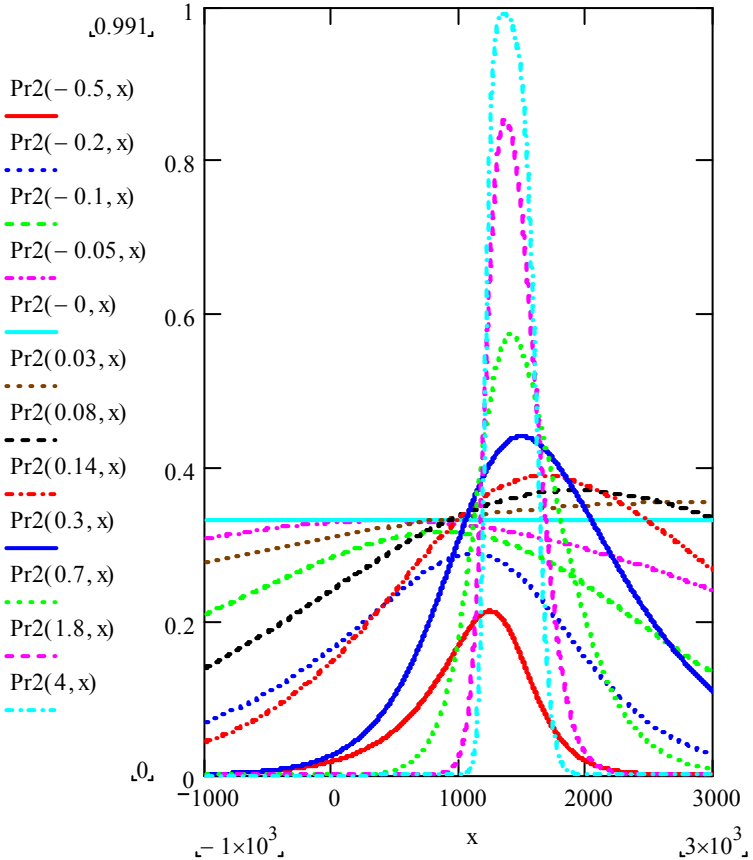

Fig. 7.8 – Preferences functions of the second alternative as the functions of the only and the same independent variable at the different cognitive parameter values

The diagrams in Fig. 7.8 are plotted in order to illustrate the behavior of the second alternative individual's subjective preferences functions at the same independent variable and the changed cognitive parameter.

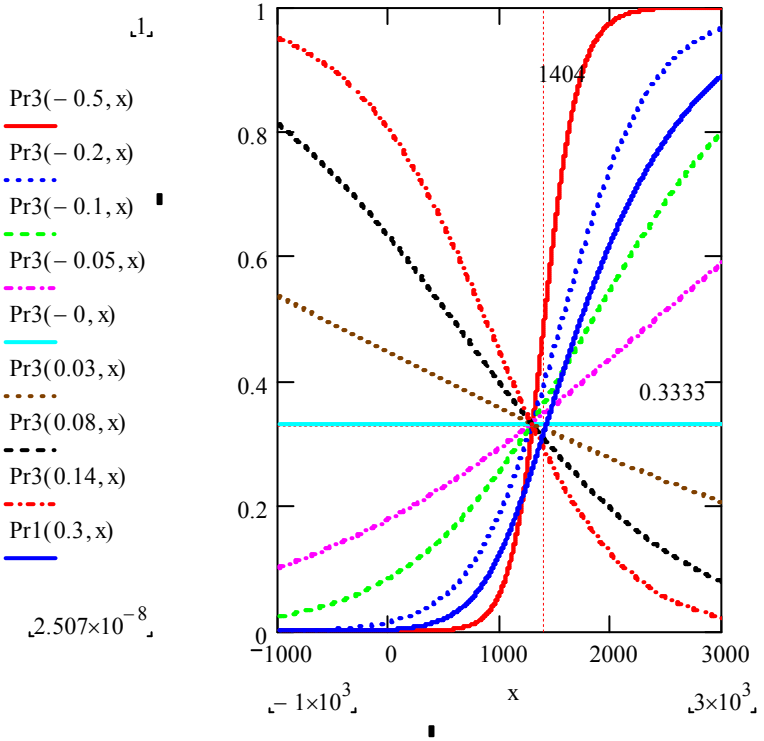

Fig. 7.9 – Preferences functions of the third alternative as the functions of the only and the same independent variable at the different cognitive parameter values

The diagrams in Fig. 7.9 are plotted in order to illustrate the behavior of the third alternative individual's subjective preferences functions at the same independent variable and the changed cognitive parameter.

The entropies are shown in Fig. 7.10.

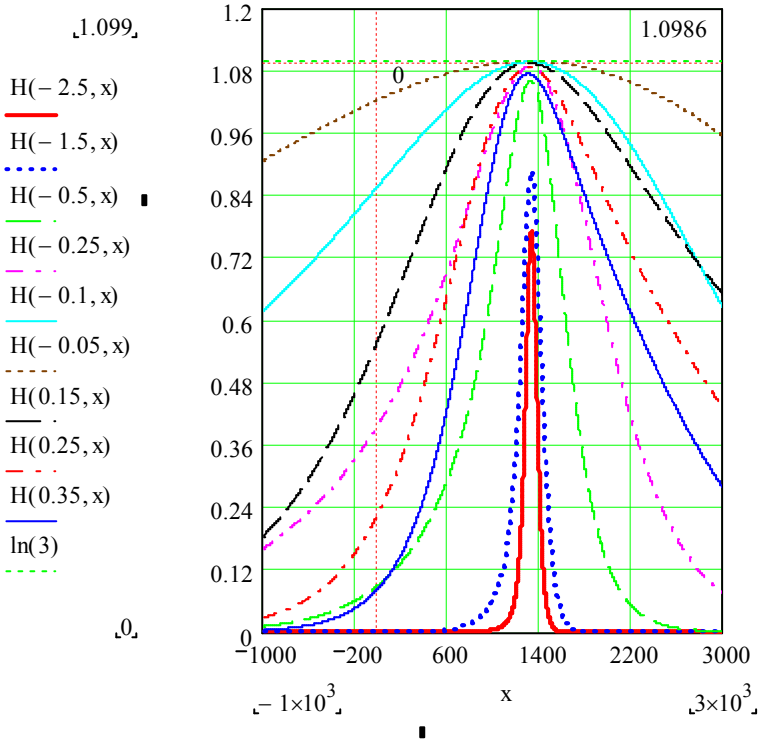

Fig. 7.10 – Entropies of the individual's subjective preferences functions of the alternative as the functions of the only and the same independent variable at the different cognitive parameter values

5. Combined hybrid relative pseudo-entropy function

Accordingly to the curves represented in Fig. 7.10 it is obvious that the traditional view entropy does not show the alternatives related direction of the air transport technologies individuals' subjective preferences uncertainty.

Also, the absolute (not relative) value of the traditional entropy cannot represent the comparable assessment value with respect to the maximally possible value of the air transport technologies effectiveness preferences uncertainty.

The certainty (uncertainty) degree of the operational situations subjective preferences distributional diversities in the view of (7.3) is not expressed in a countable manner in regards with specified prevailing alternatives preferences functions. And, neither the air transport vehicles operation alternatives subjective preferences entropy inclinations are.

To that end, it is proposed to apply a special view pseudo-entropy relative hybrid function [194, (19)]:

$$\overline{H}_{\max-\frac{\Delta\pi}{|\Delta\pi|}} = \frac{H_{\max}-H_{\pi}}{H_{\max}}\frac{\Delta\pi}{|\Delta\pi|} = \\ = \frac{H_{\max}+\sum_{i=1}^{N}\pi(\sigma_i)\ln\pi(\sigma_i)}{H_{\max}}\frac{\left[\sum_{j=1}^{M}\pi\left(\sigma_j^{+}\right)-\sum_{k=1}^{L}\pi\left(\sigma_k^{-}\right)\right]}{\left|\sum_{j=1}^{M}\pi\left(\sigma_j^{+}\right)-\sum_{k=1}^{L}\pi\left(\sigma_k^{-}\right)\right|}, \quad (7.13)$$

where $\overline{H}_{\max-\frac{\Delta\pi}{|\Delta\pi|}}$ is the mentioned above the special view pseudo-entropy relative hybrid function; $H_{\max}$ is the maximal value of the entropy at the considered problem given number of the alternatives, i.e.

$$H_{\max} = \frac{1}{\ln N}; \quad (7.14)$$

$\Delta\pi$ is the individuals' subjective preferences functions dominance index (prevailing factor); σ_i are the achievable alternatives designations; σ_j^+ are the deemed "positive", "good", "correct", alternatives designations; σ_j^- are the designations of the alternatives that "should" be reckoned with as the "negative" or "bad", "wrong" ones.

Thus, the individuals' subjective preferences functions prevailing factor (dominance index): $\Delta\pi$, figuring in the pseudo-entropy: (7.13), implies the difference

$$\Delta\pi = \sum_{j=1}^{M} \pi\left(\sigma_j^+\right) - \sum_{k=1}^{L} \pi\left(\sigma_k^-\right), \tag{7.15}$$

where $\pi\left(\sigma_j^+\right)$ and $\pi\left(\sigma_k^-\right)$ are the individuals' subjective preferences functions for the "positive": σ_j^+, and "negative": σ_k^-, attainable alternatives in the correspondingly managed operational process involving the air transportation technologies and engaging the optimal implementation of the required air transport vehicles operation.

It is supposed that in (7.1)-(7.15)

$$M + L = N\,. \tag{7.16}$$

However, the operational uncertainty treatment might imply even the third kind (type) of the subjectively assessed achievable alternatives. Those alternatives, being amongst the total number of the attainable alternatives, nevertheless, are considered to be "neutral" in regards with the "definitely" ("surely", "purely", "certainly") "positive" versus "negative" ones.

The results of the numerical simulation with (7.13)-(7.16) applicably to (7.1)-(7.8) is represented in Fig. 7.11.

And for (7.1)-(7.9), as of the independent variable: x, functional consideration, the (7.13)-(7.16) approach calculation experimentations based upon the numerical simulation bring the results illustrated with the diagrams in Fig. 7.12.

Comparing the curves portrayed in Fig. 7.11 and Fig. 7.12 one can trace the tendencies of the "break" ("fracture", "rupture", "split", "crack") points drifts.

When “negative” (“bad”, “wrong”) alternatives prevail or dominate, the value of the factor or index defined as and determined by the (7.15) equation is negative.

Therefore the hybrid relative pseudo-entropy function of (7.13) symbolizes the “negative certainty”.

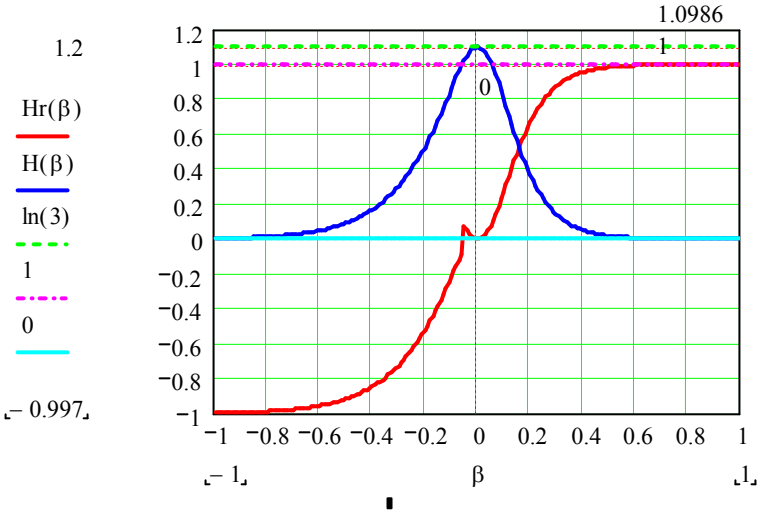

Fig. 7.11 – Pseudo-entropy relative hybrid function as the function of the cognitive parameter

That depends upon the positive value of the cognitive parameter β.

The situation changes if the value of the cognitive parameter β becomes negative.

The cognitive parameter β of the subjectively estimated value of ε comprising the aspects related to both objective and subjective nature of the operational uncertainty treatment plays, therefore, the crucial role.

Moreover, one can analyze the optimal solutions with respect to the uncertainty of the operational situations, the air transport technologies diversities, and the air transport vehicles operation alternatives via F_i.

The approach (7.1)-(7.16) allows researching the influence of other parameters.

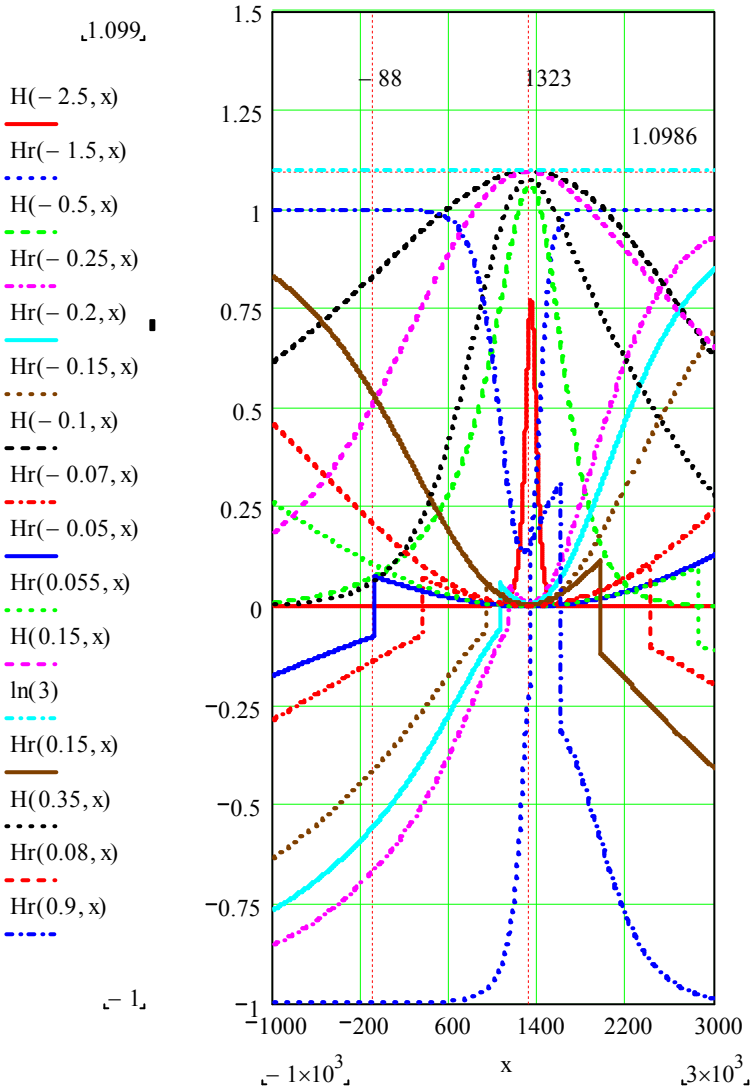

Fig. 7.12 – Pseudo-entropy relative hybrid functions as the functions of the only and the same independent variable at the different cognitive parameter values

Prevailing factors (dominance indices) are shown in Fig. 13.

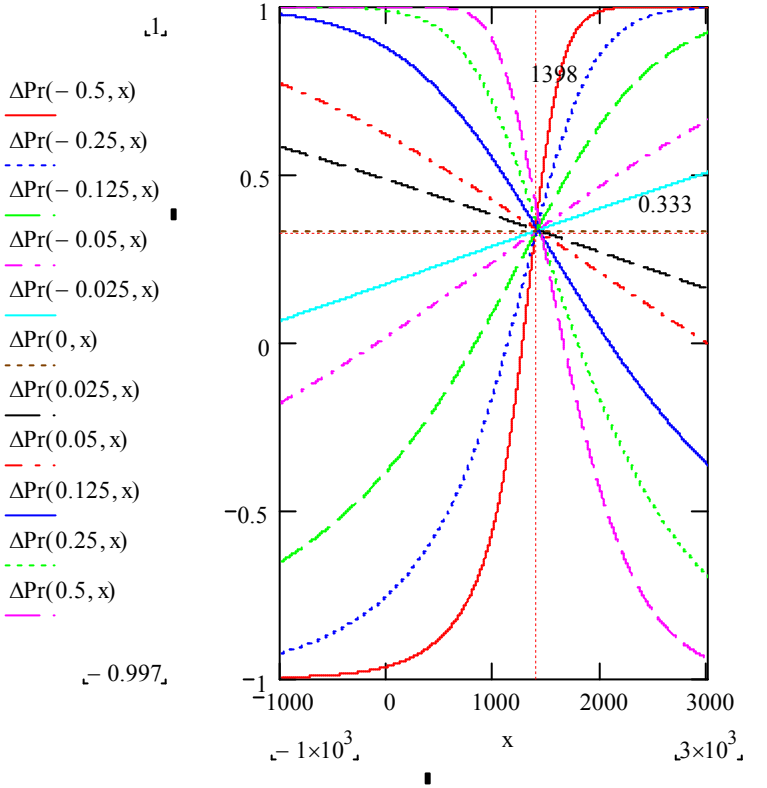

Fig. 7.13 – Prevailing factors (dominance indices) as the functions of the only and the same independent variable at the different cognitive parameter values

There are some developments of the problem; in the number of the "good", "bad", and "neutral" alternatives, their interrelationships, aircraft features, different aircraft fleets varying in the aircraft numbers, aircraft types, trajectories, distances, speeds, other random (stochastic, probability) values, cost and other economical issues, optimization principles, dynamics, subject to additional conditions or constraints and so on.

It is possible to plot three-dimensional surfaces and graphically find solutions upon them.

REPORT PREPARATION

The CGP stages are aimed at the effective CGP time management and results estimation control in the field of TOMT for AT, TT (by AT), A/C and AE M/T.

The best way is when it leads to the **SCIENTIFIC FORMALIZATION** of the **RESEARCHED MATTER.** For this purpose the **SCIENTIFIC PUBLICATIONS** suit the best.

The CGP **REPORT** is usually prepared in accordance with the **REPORT TEMPLATE.** As a rule it is provided at the corresponding **GOOGLE CLASS ROOM** and/or **UNIVERSITY REPOSITORY PAGE.**

The **REPORT** must contain the materials connected with CGP, especially with the **REPORT SECTIONS** characteristic, **INTRODUCTION, IMPORTANCE, TOPICS** etc.

The CGP work completion **REPORT** reflects the student's own achievements in acquiring the practical knowledge and skills of work in the **SCIENTIFIC FORMALIZATION** of the **RESEARCHED ISSUES.** For this purpose the **SCIENTIFIC PUBLICATIONS** suit the best.

The **REPORT** must contain the materials connected with CGP, especially with the researched object characteristic, student's own achievements etc.

The **REPORT** must be **SIGNED** (amongst the others) by the **AUTHOR (STUDENT),** with pointing the **NAMES** and **POSITIONS;** also **DATED.**

The **AUTHOR (STUDENT);** should characterize generally the topic; and He/She should emphasize the strong and weak points of the CGP work.

Finally, the **AUTHOR (STUDENT)** should evaluate the CGP work with the own reasonable and own rational **GENERAL ESTIMATION.**

After the CGP work completion (all is **SIGNED, DATED, AND SO ON**) it **(**CGP **REPORT)** must be, along with the CGP author's own **SCIENTIFIC PUBLICATIONS** (if there are any **RELEVANT**), submitted to the **DEPARTMENT COMMISSION** for the **DEFENSE**.

DEFENSE

The principal theoretical provisions can be found out in the references [1-23].

The **DEFENSE** of the CGP **REPORT,** along with the CGP **RELEVANT SCIENTIFIC PUBLICATIONS** (if there are any) on the CGP works completion takes place in the **AIR TRANSPORTATION MANAGEMENT DEPARTMENT COMMISSION** on the corresponding CGP.

The process of the **DEFENSE** is held at the specified period of time.

The **AIR TRANSPORTATION MANAGEMENT DEPARTMENT COMMISSION** on the corresponding CGP is to put the contending **STUDENT** the **FINAL ESTIMATION MARK.**

PUBLICATIONS

The principal theoretical provisions can be found out in the lecture notes of the students who have been attended the lectures, completed practical and laboratory works, finished course projects and homework etc., have some scientific inclinations and in the references [1-280].

For nowadays, it is incredibly important for the students to take part in some scientific activity. Results of such deeds as scientific research must be duly presented to the scientific community. The most popular forms of such presentation are the publications in:

1. Scientific Journals
2. Proceedings of the Scientific Conferences

In any case it is up to the students what and how to do, but relevant **PUBLICATIONS** will definitely help enter the **NEXT STAGE OF EDUCATION** and defend **EDUCATIONAL GRADUATION** and **SCIENTIFIC QUALIFICATION WORKS,** theses, dissertations etc.

Generally speaking the move toward the **PUBLICATIONS** actions may be reduced to a few indispensable steps. Perhaps, the first and apparently the most important is the choice of the scientific supervisor. It has to relate with the general theme of the research and the contender preferences. After finding such field of the creative potential application, it is reasonable to distinguish the specific direction, formulate the problem, propose the solution, and demonstrate verification of the approach and scientific findings.

All the students' findings, including made at the CGP, may be implemented into further students' achievements.

For nowadays the most valuable **PUBLICATIONS** are those indexed in the **SCOPUS** and **WEB OF SCIENCE SCIENTIFIC DATABASES.**

REFERENCES

1. Reference Study Corgi. (2021, October 2). Technological Changes and Air Transport. Retrieved from https://studycorgi.com/technological-changes-and-air-transport/
2. Doganis, Rigas (2019). Flying Off Course: Airline Economics and Marketing. p. 29. ISBN 978-1138224230.
3. Leinbach, T.R., Bowen, J.T. (2004). Airspaces: Air Transport, Technology, and Society. In: Brunn, S.D., Cutter, S.L., Harrington, J.W. (eds) Geography and Technology. Springer, Dordrecht. https://doi.org/10.1007/978-1-4020-2353-8_13.
4. Kroes M. J. Aircraft maintenance and repair: 7th ed. / M. J. Kroes, W. A. Watkins, F. Delp, R. Sterkenburg. – New York, New York, USA, McGraw-Hill, Education, 2013. – 736 p.
5. Wild T. W. Aircraft powerplants: 8th ed. / T. W. Wild, M. J. Kroes. – New York, New York, USA: McGraw-Hill, Education, 2014. – 756 p.
6. Hannigan, John A. (1982). "Unfriendly Skies: The Decline of the World Aviation Cartel". The Pacific Sociological Review. 25 (1): 107–136. doi:10.2307/1388890. ISSN 0030-8919. JSTOR 1388890. S2CID 158297510.
7. "IATA by Region". International Air Transport Association. Retrieved 14 February 2016.
8. Koffler, Warren (Spring 1966). "IATA: Its legal structure - A critical review". Journal of Air Law and Commerce. 32: 222–235.
9. Kasianov, V.: Subjective entropy of preferences. Subjective analysis. – Institute of Aviation Scientific Publications, Warsaw, Poland, 2013. – 644 p.
10. Jaynes, E. T.: Information theory and statistical mechanics. Physical review 106(4), 620–630 (1957).
11. Jaynes, E. T.: Information theory and statistical mechanics. II. Physical review 108(2), 171–190 (1957).
12. Jaynes, E. T.: On the rationale of maximum-entropy methods. Proceedings of the IEEE 70, 939–952 (1982).
13. Silberberg, E., Suen, W.: The structure of economics. A mathematical analysis. McGraw-Hill Higher Education, New York, 2001. – 668 p.
14. Airworthiness manual: ICAO Doc 9760, 3rd Edition. – Montreal, Quebec, Canada: ICAO, 2014. – 281 p.
15. Dhillon B. S. Maintainability, maintenance, and reliability for engineers / B. S. Dhillon. – New York: Taylor & Francis Group, 2006. – 214 p.
16. Lind D. A. Basic statistics for business and economics: 2nd ed. / D. A. Lind, R. D. Mason. – Boston, Massachusetts, USA: Irwin/McGraw-Hill, 1997. – 597 p.

17. Smith D. J. Reliability, maintainability and risk. Practical methods for engineers / D. J. Smith. – London: Elsevier, 2005. – 365 p.

18. Pearce W. Duesenberg aircraft engines: a technical description / W. Pearce. – Los Osos, CA, USA: Old Machine Press, 2012. – 112 p.

19. Kodera C. America's round-engine airliners: airframes and powerplants in the golden age of aviation / C. Kodera, W. Pearce. – Forest Lake, MN, USA: Specialty Press, 2019. – 216 p.

20. Shannon Mr. Basics of aircraft maintenance programs for financiers / Mr. Shannon, P. Ackert. – https://pdf4pro.com/fullscreen/basics-of-aircraft-maintenance-programs-for-19957a.html, 2010. – 23 p.

21. Gazdik, J.G. Rate-Making and the IATA Traffic Conferences . Journal of Air Law and Commerce, vol. 16, no. 3, Summer 1949, pp. 298–322.

22. Koffler, Warren W (1 January 1966). "IATA: Its Legal Structure - A Critical Review". Journal of Air Law and Commerce. 32 (2): 222.

23. Пискунов Н. С. Дифференциальное и интегральное исчисления для втузов / Н. С. Пискунов, т. 2: Учебное пособие для втузов. 13-е изд. – М.: Наука, Главная редакция физико-математической литературы, 1985. – 560 с.

24. Запорожец В. В., Олефир А. И., Смирнов Ю. И., Билякович О. Н., Закиев И. М., Гончаренко А. В. Геометрическое проектирование базовых шасси спецмашин: Учебно-методическое пособие для студентов специальности 7.100108 «Эксплуатация авиационной наземной техники» по курсу «Теория и конструкция базовых шасси спецмашин». – Киев: КМУГА, 1998. – 12 с.

25. Запорожец В. В., Олефир А. И., Смирнов Ю. И., Билякович О. Н., Закиев И. М., Гончаренко А. В. Весовое проектирование базовых шасси спецмашин: Учебно-методическое пособие для студентов специальности 7.100108 «Эксплуатация авиационной наземной техники» по курсу «Теория и конструкция базовых шасси спецмашин». – Киев: КМУГА, 1998. – 12 с.

26. Гончаренко А. В. Постановка задачі про вибір оптимального рівня витрат на підтримання безпеки польотів / А. В. Гончаренко // НАУКА І МОЛОДЬ: Матеріали міжнародної наукової конференції. – К.: НАУ, 2001. – С. 110.

27. Касьянов В. А., Гончаренко А. В. Оценка характеристик функционирования системы в условиях, допускающих возникновение техногенных катастроф // Сучасні авіаційні технології: Матеріали IV Міжнародної науково-технічної конференції “АВІА-2002”. - Т.3. - К.: НАУ, 2002. – С. 31.23-31.26.

28. Теорія та конструкція теплових двигунів: Лабораторні роботи / Уклад.: О.В. Кулініч, А.А. Воробйов, А.В. Гончаренко. – К.: НАУ, 2002. – 72 с.

29. Експлуатація авіаційної наземної техніки. Лабораторні роботи 1-4. / Уклад.: О.М. Білякович, Г.М. Гелетуха, А.В. Гончаренко. – К.: НАУ, 2002. – 32 с.

30. Pluzhnikov B. O. Construction Machinery, Equipment and Road Machines. Earth-moving Machines: The course of lectures / B.O. Pluzhnikov, A.V. Goncharenko, V.I. Lychik. – K.: NAU, 2002. – 40 p.

31. Kasyanov V., Goncharenko A. Modelling of technical and economical aspects of flight safety // The World Congress "Aviation in the XXI-st Century" press-release. K, Ukraine: NAU, 2003. – pp. 2.63-2.66.

32. Касьянов В. О., Гончаренко А. В. Визначення оптимальної швидкості витрат ресурсів, які спрямовуються безпосередньо на підтримку безпеки польотів // Виробництво та експлуатація авіаційної техніки: Матеріали V Міжнародної науково - технічної конференції "АВІА-2003". - Т.3. - К.: НАУ, 2003. – С. 31.7-31.11.

33. Гончаренко А. В. Моделювання впливу профілактичних замін на показники безпеки польотів / А. В. Гончаренко // Вісник НАУ. – 2004. – № 3(21). – С. 74-77.

34. Гончаренко А. В. Обоснование величины инвестиций в безопасность полетов с учетом коэффициента технического использования / А. В. Гончаренко // Наука і молодь. Прикладна серія: Збірник наукових праць. – К.: НАУ, 2004. – Вип. 4. – С. 15-18.

35. Касьянов В. О., Гончаренко А. В. Статистичні оцінки частоти катастроф // Вісник НАУ. 2004. №4(22). – К.: НАУ, 2004. – С. 16-20.

36. Касьянов В. А., Гончаренко А. В. Субъективный анализ и безопасность активных систем // Кибернетика и вычислительная техника. – 2004. – Вып. 142. – С. 41-56.

37. Касьянов В. О., Гончаренко А. В. Параметричні дослідження комплексного техніко-економічного критерію безпеки // Вісник НАУ. 2004. №1(19). – К.: НАУ, 2004. – С. 109-112.

38. Гончаренко А. В. Керування підтриманням безпеки польотів через технічні та витратні чинники: автореф. … канд. техн. наук: 05.13.03 / А. В. Гончаренко. – К.: НАУ, 2005. – 20 с.

39. Kasjanov V. Quantitative models of influence of subjective factors on flight safety / V. Kasjanov, A. Goncharenko // Proceedings of The Second World Congress "Aviation in the XXI st Century", Kyiv, September 19-21, 2005. – Kyiv, Ukraine: NAU, 2005. – pp. 6.38-6.42.

40. Kasjanov V. Theoretical mechanics. Statics. Kinematics: Summary of lectures / V. Kasjanov, V. Karachun, A. Goncharenko. – Kyiv: NAU, 2005. – 148 p.

41. Druch O. Basics of Ecology. Synopsis of lectures / O. Druch, A. Honcharenko, G. Franchuk. – Kyiv: NAU, 2005. – 124 p.

42. Goncharenko A. V. Introduction to Dynamics (Theoretical Mechanics) [video] / A. V. Goncharenko // Tallinna Tehnikakõrgkool. – 07 December, 2006. – 14:47 minutes. – NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/42059

43. Goncharenko A. V. The first problem of Dynamics [video] / A. V. Goncharenko // Tallinna Tehnikakõrgkool. – 07 December, 2006. – 14:51 minutes. – NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/42063

44. Goncharenko A. V. Application of the first problem of the material particle Dynamics [video] / A. V. Goncharenko // Tallinna Tehnikakõrgkool. – 07 December, 2006. – 13:18 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/42064

45. Гончаренко А. В. Вплив суб'єктивних переваг на показники роботи суднової енергетичної установки / А. В. Гончаренко // Автоматика, автоматизация, электротехнические комплексы и системы. – 2008. – № 2(22). – С. 105-111.

46. Гончаренко А. В. Моделювання впливу ентропії суб'єктивних переваг на прийняття рішень стосовно ремонту суднової енергетичної установки / А. В. Гончаренко // Автоматика, автоматизация, электротехнические комплексы и системы. – 2009. – № 1(23). – С. 123-131.

47. Гончаренко А. В. Аналіз гвинтової характеристики двигуна 5 ДКРН 70/226,8 за питомою витратою палива / А. В. Гончаренко // Науковий вісник ХДМІ. – 2009. – № 1(1). – С. 16-24.

48. Гончаренко А. В. Аналіз параметричних досліджень реологічних властивостей водовугільних суспензій для застосування у суднових двигунах внутрішнього згоряння / А. В. Гончаренко // Авиационно-космическая техника и технология. – 2009. – № 8(65). – С. 90-95.

49. Гончаренко А. В. Варіанти вибору стратегії підтримання безпеки функціонування транспортної системи / А. В. Гончаренко // Вісник НАУ. – 2009. – № 2(39). – С. 30-35.

50. Гончаренко А. В. Дослідження характеристики двигуна стосовно зміни оптимальних значень / А. В. Гончаренко // Сучасні інформаційні та інноваційні технології на транспорті (MINTT-2009). [Збірка наукових праць у п'яти томах. (25-27 травня 2009 р., Херсон)]: Матеріали Міжнародної науково-практичної конференції. – Том 4. – Херсон: Видавництво Херсонського державного морського інституту, 2009. – С. 45-48.

51. Гончаренко А. В. Показники безпеки функціонування транспортної системи в умовах зростання цін на пальне / А. В. Гончаренко // Вісник НАУ. – 2009. – № 1(38). – С. 35-39.

52. Goncharenko A. V. Fuel oil atomization characteristics smoothed by a logarithm normal distribution for marine diesel engines / A. V. Goncharenko // Двигатели внутреннего сгорания. – 2010. – № 2. – pp. 34-40. (ISSN 0419-8719)

53. Goncharenko A. V. Optimal dividing between purchasing and fabrication / A. V. Goncharenko // Сучасні енергетичні установки на транспорті, технології та обладнання для їх обслуговування: Республіканська науково-практична конференція, Херсон, 5-7 жовтня 2010 р.: матеріали конф. – Херсон, 2010. – pp. 54-55.

54. Goncharenko A. V. Prospects of alternative sources of energy and engines used in ships propulsion and power plants / A. V. Goncharenko // Сучасні енергетичні установки на транспорті, технології та обладнання для їх обслуговування: Республіканська науково-практична конференція, Херсон, 5-7 жовтня 2010 р.: матеріали конф. – Херсон, 2010. – pp. 115-116.

55. Goncharenko A. V. Research of operational effectiveness changes / A. V. Goncharenko // Сучасні енергетичні установки на транспорті, технології та обладнання для їх обслуговування: Республіканська науково-практична конференція, Херсон, 5-7 жовтня 2010 р.: матеріали конф. – Херсон, 2010. – pp. 20-23.

56. Гончаренко А. В. Вибір оптимальної комерційної швидкості транспортного судна / А. В. Гончаренко // Науковий вісник ХДМІ. – 2010. – № 1(2). – С. 41-49.

57. Гончаренко А. В. Методичні рекомендації до дипломного проектування / А.В. Гончаренко. – Херсон: Видавництво ПП Тріфонов, друкарня «Графіка», 2010. – 63 с. (ISBN: 978-966-2997-06-4)

58. Гончаренко А. В. Оформлення звітності з плавальної практики судномеханіка (заповнення книги реєстрації практичної підготовки) за спеціальністю «Експлуатація суднових енергетичних установок» усіх форм навчання: навчальний посібник для ВНЗ / А.В. Гончаренко. – Херсон: Видавництво ПП Вишемирський В.С., 2010. – 128 с.

59. Гончаренко А. В. Принципові питання змісту та методики виконання дипломної роботи за спеціальністю «Експлуатація суднових енергетичних установок» усіх форм навчання: навчальний посібник для ВНЗ / А. В. Гончаренко. – Херсон: Видавництво ПП Тріфонов, друкарня «Графіка», 2010. – 165 с. (ISBN: 978-966-2997-08-8)

60. Гончаренко А. В. Типи задач рекомендованих до опрацювання при виконанні дипломної роботи за спеціальністю «Експлуатація суднових енергетичних установок» усіх форм навчання: навчальний посібник для ВНЗ / А. В. Гончаренко. – Херсон: Видавництво ПП Тріфонов, друкарня «Графіка», 2010. – 192 с. (ISBN: 978-966-2997-07-1)

61. Овчарук О. М. Загальна формула розподілу осереднених швидкостей рідини в круглоциліндричній трубі / О. М. Овчарук, А. В. Гончаренко // Науковий вісник ХДМІ. – 2010. – №1(2). – С. 198-210.

62. Kasjanov V. O. Models of competitors' preferences influence upon the number of seafarers on board and ashore / V.O. Kasyanov, A.V. Goncharenko // Науковий вісник ХДМІ: Науковий журнал. – Херсон: Видавництво ХДМІ, 2010. – №2(3). – С. 231-237.

63. Kasyanov V. O. Problems of specialists training in the field of ships propulsion and power plants operation on the principles of the subjective analysis / V.O. Kasyanov, A.V. Goncharenko // Сучасні енергетичні установки на транспорті, технології та обладнання для їх обслуговування: Республіканська науково-практична конференція, Херсон, 5-7 жовтня 2010 р.: матеріали конф. – Херсон, 2010. – С. 131-133.

64. Kasyanov V. O. Approach to flight safety in terms of the subjective analysis / V.O. Kasyanov, A.V. Goncharenko // Proceedings of The Fourth World Congress "Aviation in the XXI-st Century". "Safety in Aviation and Space Technologies". Kyiv, September 21-23, 2010. – Kyiv, Ukraine: NAU, 2010. – Vol. 1, pp. 14.20-14.23.

65. Касьянов В. А. Субъективные предпочтения и правовое воздействие как факторы развития двигателестроения / В.А. Касьянов, А.В. Гончаренко, С.В. Кружкова // Авиационно-космическая техника и технология. Информационные технологии: сб. науч. тр. / М-во образования и науки Украины, Нац. аэрокосм. ун-т им. Н.Е. Жуковского «ХАИ». – Х., 2010. – Вып. № 7(74). – С. 182-189.

66. Goncharenko A. V. Expediency of an improvement for a diesel-geared propulsion with respect to subjectively preferred operational factors / A. V. Goncharenko // Науковий вісник ХДМІ. – 2011. – № 1(4). – pp. 30-41.

67. Goncharenko A. V. Operational reliability measures for marine propulsion diesel engines / A. V. Goncharenko // Сучасні енергетичні установки на транспорті і технології та обладнання для їх обслуговування: Всеукраїнська науково-практична конференція, Херсон, 12-14 жовтня 2011 р.: матеріали конф. – Херсон, 2011. – pp. 23-27.

68. Goncharenko A. V. Subjective preferences for optimal economy continuous rating of MaK 9M453C / A. V. Goncharenko // Сучасні інформаційні та інноваційні технології на транспорті: III Міжнародна науково-практична конференція, Херсон, 23-25 травня 2011 р.: матеріали конф. У 2-х тт. Том 2. – Херсон: Видавництво Херсонського державного морського інституту, 2011. – pp. 114-119.

69. Goncharenko A. V. The optimal commercial speed of a transport vessel with respect to operators' subjective preferences / A. V. Goncharenko // Науковий вісник ХДМІ. – 2011. – № 2(5). – pp. 12-20.

70. Goncharenko A. V. Mathematical modeling of the ship's main engine random operational process / A. V. Goncharenko // Двигатели внутреннего сгорания. – 2012. – № 2. – pp. 117-125. (ISSN 0419-8719)

71. Goncharenko A. V. Measures for estimating transport vessels operators' subjective preferences uncertainty / A. V. Goncharenko // Scientific Bulletin of Kherson State Maritime Academy. – 2012. – № 1(6). – pp. 59-69.

72. Kasyanov V. O. Variational principle in the problem of ship propulsion and power plant operation with respect to subjective preferences / V.O. Kasyanov, A.V. Goncharenko // Науковий вісник Херсонської державної морської академії: Науковий журнал. – Херсон: Видавництво ХДМА, 2012. – № 2(7). – С. 56-61. (ISSN 2077-3617)

73. Kasyanov V. A. The concept of SPPP operational processes multi-alternativeness in terms of subjective analysis / V.A. Kasyanov, A.V. Goncharenko // Сучасні інформаційні та інноваційні технології на транспорті (MINTT-2012): збірка матеріалів IV Міжнародної науково-практичної конференції. У 2-х тт. Т. 1. – Херсон: Херсонська державна морська академія, 2012. – С. 106-108.

74. Goncharenko A. V. A concept of entropy approach to the problem of multi-alternative operational modes control / A. V. Goncharenko // Науковий вісник ХДМА. – 2013. – № 2(9). – pp. 26-34.

75. Goncharenko A. V. A particular case of a variational problem of control in an active aviation system / A. V. Goncharenko // Transactions of the institute of aviation. – 2013. – № 228, pp. 3-12.

76. Goncharenko A. V. Aircraft maximal distance horizontal flights in the conceptual framework of subjective analysis / A. V. Goncharenko // Proceedings of the NAU. – 2013. – № 4(57). – pp. 56-62.

77. Goncharenko A. V. Artificial versus natural intellect in control of optimality / A. V. Goncharenko // Інтелектуальні системи прийняття рішень та проблеми обчислювального інтелекту: міжнародна наукова конференція, Євпаторія, 20-24 травня 2013 р.: матеріали конф. – Херсон: ХНТУ, 2013. – pp. 20-22. (ISBN 978-966-8912-70-2)

78. Goncharenko A. V. Horizontal flight for maximal distance at presence of conflict behavior (control) of the aircraft control system active element / A. V. Goncharenko // Матеріали XI міжнародної науково-технічної конференції "ABIA-2013". (21-23 травня 2013 р., Київ). – Т. 4. – К.: НАУ, 2013. – pp. 22.30-22.33.

79. Goncharenko A. V. Conflictability of operational situations in terms of entropy paradigm / A. V. Goncharenko // Сучасні інформаційні та інноваційні технології на транспорті (MINTT-2013) [Збірка матеріалів V Міжнародної науково-практичної конференції. У 2-х тт. (28-30 травня 2013 р., Херсон)]. – Т. 1. – Херсон: Херсонська державна морська академія, 2013. – pp. 115-118.

80. Goncharenko A. V. Control of flight safety with the use of preferences functions / A. V. Goncharenko // Electronics and control systems. – 2013. – № 3(37). – pp. 113-119. (ISSN: 1990-5548)

81. Goncharenko A. V. Expediency of unmanned air vehicles application in the framework of subjective analysis / A. V. Goncharenko // 2013 IEEE 2nd International Conference "Actual Problems of Unmanned Air Vehicles Developments" Proceedings. – October, 15-17, 2013, Kyiv, Ukraine. – 2013. – pp. 129-133.

82. Goncharenko A. V. Rational modes of operation for a four-arm tiller electro-hydraulic steering gear with respect to multi-alternativeness and preferences / A. V. Goncharenko // Науковий вісник ХДМА. – 2013. – № 1(8). – С. 28-34. (ISSN 2077-3617)

83. Goncharenko A. V. Subjective entropy extremization principle as a tool of an aircraft maximal duration horizontal flight control / A. V. Goncharenko // Авиационно-космическая техника и технология. – 2013. – Вып. 8(105). – pp. 229-234.

84. Goncharenko A. V. Subjective entropy maximum principle for preferences functions of alternatives given in the view of logical conditions / A. V. Goncharenko // Штучний інтелект. – 2013. – № 4(62). – 1 G. pp. 4-9.

85. Goncharenko A. V. The optimal internal "shadow" taxation on condition of a firm external economic activity / A. V. Goncharenko, O. A. Zaporozchenko // Proceedings of the NAU. – 2013. – № 2(55). – pp. 251-257.

86. Гончаренко А. В. Оптимальне внутрішнє тіньове оподаткування за умови зовнішньоекономічної діяльності фірми / А. В. Гончаренко, О. А. Запорожченко // Вісник НАУ. – 2013. – № 2(55). – С. 251-257.

87. Entropy paradigm in the theory of hierarchical active systems. Elements of conflict theory / V.A. Kasianov, K. Szafran, A.V. Goncharenko, T.V. Shipitiak // Prace Instytutu Lotnictwa Transactions of the institute of aviation. – Warszawa Warsaw, Poland: Institute of Aviation Scientific Publications, 2013. – № 5-6 (232-233), pp. 115-128.

88. Kasianov V. A. Subjectively preferred optimally controlled modes of operation for an aircraft maximal duration horizontal flight / V.A. Kasianov, A.V. Goncharenko // Авиационно-космическая техника и технология: сб. науч. тр. / М-во образования и науки Украины, Нац. аэрокосм. ун-т им. Н. Е. Жуковского «ХАИ». – Х., 2013. – Вып. 10 (107). – С. 112-117.

89. Kasianov V. A. Invariants and first integrals for a special case of a controlled process in an active aviation system / V.A. Kasianov, A.V. Goncharenko // Восточно-Европейский журнал передовых технологий. Системы управления. – Харьков: Технологический Центр, 2013. – Т. 3, №3(63), С. 10-13.

90. Касьянов В. А. Свет и тень. Пропорции теневой экономики. Энтропийный подход: монография / В.А. Касьянов, А.В. Гончаренко. – К.: Кафедра, 2013. – 86 с. (ISBN 978-966-2705-36-2)

91. Goncharenko A. V. A concept of ballast water treatment on the basis of multi-alternativeness / A. V. Goncharenko, V. A. Evdokimova // Сучасні інформаційні та інноваційні технології на транспорті (MINTT-2014) [Збірка матеріалів VI Міжнародної науково-практичної конференції. (27-29 травня 2014 р., Херсон)]. – Херсон: Херсонська державна морська академія, 2014. – pp. 18-21.

92. Goncharenko A. V. Extremality of control and preferences distributions "goodness" / A. V. Goncharenko // Electronics and control systems. – 2014. – № 4(42). – pp. 84-90. (ISSN: 1990-5548)

93. Goncharenko A. V. Preferences distributions densities for a common continuous alternative / A. V. Goncharenko // Науковий вісник ХДМА. – 2014. – № 2(11). – pp. 22-27. (ISSN 2313-4763)

94. Goncharenko A. V. Safe maneuvering of a ship in a multi-alternative operational situation / A. V. Goncharenko // Bezpieczeństwo na lądzie, morzu i w powietrzu w XXI wieku. – 2014. – pp. 207-210. (ISBN 978-83-61520-02-3)

95. Goncharenko A. V. Safety and its entropy measures of certainty or uncertainty / A. V. Goncharenko // Безпека життєдіяльності на транспорті і виробництві – освіта, наука, практика (SLA-2014) [збірник матеріалів Міжнародної науково-практичної конференції. (18-19 вересня 2014 р., Херсон)]. – Херсон: Херсонська державна морська академія, 2014. – pp. 44-46.

96. Goncharenko A. V. Navigational alternatives, their control and subjective entropy of individual preferences / A. V. Goncharenko // 2014 IEEE 3rd International Conference "Methods and Systems of Navigation and Motion Control (MSNMC)" Proceedings. – October, 14-17, 2014, Kyiv, Ukraine. – 2014. – pp. 99-103.

97. Пат. 94181 Україна, МПК B63H 25/00. Спосіб вибору оптимальної комбінації режимів експлуатації суднової рульової машини / А. В. Гончаренко; заявник та власник патенту Національний авіаційний університет. – № u 2013 09054; заявл. 19.07.2013; опубл. 10.11.2014, Бюл. № 21.

98. Kasianov V. A. Control in a hierarchical active system on the basis of entropy paradigm of subjective analysis / V.A. Kasianov, A.V. Goncharenko, K. Szafran // Prace Instytutu Lotnictwa Transactions of the institute of aviation. – Warszawa Warsaw, Poland: Institute of Aviation Scientific Publications, 2014. – № 4 (237), pp. 30-38.

99. Kasianov V. A. Modeling of control in a hierarchical active system on the basis of entropy paradigm of subjective analysis / V.A. Kasianov, A.V. Goncharenko, K. Szafran // Transactions of the institute of aviation.

Selected problems of air transport. – Warsaw, Poland: Institute of Aviation Scientific Publications, 2014. – № 4(237), pp. 39-48.

100. Kasianov V. A. Recursive models of psychodynamics in the framework of subjective entropy of preferences paradigm / V.A. Kasianov, A.V. Goncharenko // Proceedings of The Sixth World Congress "Aviation in the XXI-st Century" "Safety in Aviation and Space Technologies". Kyiv, Ukraine, 23-25 вересня, 2014 р.: матеріали конгр. – Київ, NAU; 2014. – Vol. 3, pp. 9.5-9.10.

101. Касьянов В. А. Рекурсивные модели психодинамики для прогнозирования поведения активных систем управления с памятью / В.А. Касьянов, А.В. Гончаренко // ScienceRise. Технічні науки. – Харків: ПП «Технологічний Центр», 2014. – № 2 (2). – С. 72-78.

102. Kasianov V. A. Connection of subjective entropy maximum principle to the main laws of psych / V.A. Kasianov, A.V. Goncharenko // Research in Psychology and Behavioral Sciences. – 2014. – Vol. 2, No. 3. – pp. 59-65.

103. Kasianov V. A. Light and shadow economy proportions and entropy approach to principal laws of psychodynamics / V.A. Kasianov, A.V. Goncharenko // Інтелектуальні системи прийняття рішень та проблеми обчислювального інтелекту: міжнародна наукова конференція, Залізний Порт, Україна, 28-31 травня 2014 р.: матеріали конф. – Херсон: ХНТУ, 2014. – С. 9-11. (ISBN 978-966-8912-90-0)

104. Goncharenko A. V. Some identities of subjective analysis derived on the basis of the subjective entropy extremization principle by Professor V.A. Kasianov / A.V. Goncharenko // Automatic Control and Information Sciences. – 2014. – Vol. 2, No. 1. – pp. 20-25.

105. Kasianov V. A. A Recursive Model of a Quasi-Isolated Elementary Social System Dynamics / V. A. Kasianov, A. V. Goncharenko // NAU electronic repository. - http://dspace.nau.edu.ua/handle/NAU/37759 - January 01, 2015. – 5 p.

106. Goncharenko A. V. A hybrid pseudo-entropy function for a decision making in conditions of uncertainty / A. V. Goncharenko // Інтелектуальні системи прийняття рішень та проблеми обчислювального інтелекту: міжнародна наукова конференція, Залізний Порт, Україна, 25-28 травня 2015 р.: матеріали конф. – Херсон: Видавництво ХНТУ, 2015. – pp. 174-176. (ISBN 978-966-2207-24-8)

107. Касьянов В. А. Эволюция активных изолированных систем с точки зрения принципа максимума субъективной энтропии / В.А. Касьянов, А.В. Гончаренко // Міжнародний науковий форум: соціологія, психологія, педагогіка, менеджмент [Текст] : збірник наукових праць. Вип. 17 / Нац. пед. ун-т ім. М.П. Драгоманова ; ред. колегія В. Б. Євтух [и др.]. – Київ : Інтерсервіс, 2015. – С. 207-226. (ISSN 2307-4825)

108. Касьянов В. А. Вариационные принципы субъективного анализа. Модифицированный вариационный принцип Эйлера-Лагранжа. Энтропийный подход: монография / В.А. Касьянов, А.В. Гончаренко. – К.: ДП НВЦ «Приорітети», 2015. – 112 с. (ISBN 978-966-8809-67-5)

109. Goncharenko A. V. Applicable aspects of alternative UAV operation / A. V. Goncharenko // 2015 IEEE 3rd International Conference "Actual Problems of Unmanned Aerial Vehicles Developments (APUAVD)" Proceedings. October, 13-15, 2015, Kyiv, Ukraine. – К.: Освіта України, 2015. – pp. 316-319.

110. Kasianov V. A. Multi-alternativeness of aircraft airworthiness support modern technologies / V. A. Kasianov, A. V. Goncharenko // Proceedings of The Seventh World Congress "Aviation in the XXI-st Century" "Safety in Aviation and Space Technologies". Kyiv, Ukraine, September 19-21, 2016: матеріали конгр. – Київ, NAU; 2016. – pp. 1.2.1-1.2.5.

111. Goncharenko A. V. Distinguishing minimal engineering diagnosis risks via preferences functions / A. V. Goncharenko // Proceedings of The Seventh World Congress "Aviation in the XXI-st Century" "Safety in Aviation and Space Technologies". Kyiv, Ukraine, September 19-21, 2016: матеріали конгр. – Київ, NAU; 2016. – pp. 1.2.6-1.2.10.

112. Goncharenko A. V. Modeling aviation legislation influence upon airworthiness support technologies via preferences functions / A. V. Goncharenko // Proceedings of The Seventh World Congress "Aviation in the XXI-st Century" "Safety in Aviation and Space Technologies". Kyiv, Ukraine, September 19-21, 2016: матеріали конгр. – Київ, NAU; 2016. – pp. 1.2.11-1.2.15.

113. Kasianov V. A. Variational principle of psychology / V.A. Kasianov, A.V. Goncharenko // Proceedings of The Seventh World Congress "Aviation in the XXI-st Century" "Safety in Aviation and Space Technologies". Kyiv, Ukraine, September 19-21, 2016: матеріали конгр. – Київ, NAU; 2016. – pp. 9.187-9.190.

114. Goncharenko A. V. Several models of artificial intelligence elements for aircraft control / A. V. Goncharenko // 2016 IEEE 4th International Conference "Methods and Systems of Navigation and Motion Control (MSNMC)" Proceedings. – October, 18-20, 2016, Kyiv, Ukraine. – 2016. – pp. 224-227.

115. Goncharenko A. V. Several models of physical exercise subjective preferences / A. V. Goncharenko // Clin. and Exp. Psychol. – 2016. – 2: 121. – pp. 1-6. doi:10.4172/2471-2701.1000121. (ISSN: 2471-2701 CEP)

116. Goncharenko A. V. Optimal managerial and control values for active operation / A. V. Goncharenko // Electronics and control systems. – 2016. – № 3(49). – pp. 112-115. (ISSN: 1990-5548)

117. Гончаренко А. В. Експлуатація активних транспортних систем в умовах багатоальтернативності та невизначеності: автореф. … докт. техн. наук: 05.22.20 / А. В. Гончаренко. – К.: НАУ, 2016. – 39 с.

118. Sushchenko O. Design of Robust Systems for Stabilization of Unmanned Aerial Vehicle Equipment / O. Sushchenko, A. Goncharenko // International Journal of Aerospace Engineering. – Volume 2016 (2016), Article ID 6054081, 10 pages http://dx.doi.org/10.1155/2016/6054081; 2016. – pp. 1-10.

119. Goncharenko A. V. Alternativeness of control and power equipment repair versus purchasing according to the preferences of the options / A. V. Goncharenko // Electronics and control systems. – 2016. – № 4(50). – pp. 98-101.

120. Goncharenko A. V. One theoretical aspect of entropy paradigm application to the problems of tribology / A. V. Goncharenko // Problems of friction and wear. – 2017. – № 1(74). – pp. 78-83. (ISSN 0370-2197 print)

121. Kasianov V. A. Extremal Principle of Subjective Analysis. Light and Shadow. Proportions of Shadow Economy. Entropy Approach. Екстремальний принцип суб'єктивного аналізу. Світло і тінь. Пропорції тіньової економіки. Ентропійний підхід (англійською мовою): monograph / V. A. Kasianov, A. V. Goncharenko. – Kyiv, Ukraine: Publishing House "Kafedra", 2017. – 90 p. (ISBN 978-617-7301-41-6)

122. Kasianov V. A. Subjective entropy maximum principle and its applications / V. A. Kasianov, A. V. Goncharenko // Авіаційна та екстремальна психологія у контексті технологічних досягнень: збірник наукових праць / за заг. ред. Л. В. Помиткіної, Т. В. Вашеки, О. В. Сечейко. – К.: Аграр Медіа Груп, 2017. – 317 с. pp. 116-120.

123. Kasianov V. A. Subjective entropy approach applicability to aeronautical engineering operational problems / V. A. Kasianov, A. V. Goncharenko // Матеріали XIII міжнародної науково-технічної конференції "АВІА-2017". (19-21 квітня 2017 р., Київ). – К.: НАУ, 2017. – pp. 17.5-17.8.

124. Goncharenko A. V. Human factor aspect applicably to aeronautical engineering maintenance / A. V. Goncharenko // Матеріали XIII міжнародної науково-технічної конференції "АВІА-2017". (19-21 квітня 2017 р., Київ). – К.: НАУ, 2017. – pp. 17.9-17.13.

125. Goncharenko A. V. Bayes criterion modified with subjective preferences functions densities distributions used at the choosing of the decision making thresholds / A. V. Goncharenko // Матеріали XIII міжнародної науково-технічної конференції "АВІА-2017". (19-21 квітня 2017 р., Київ). – К.: НАУ, 2017. – pp. 17.17-17.21.

126. Goncharenko A. V. Optimal maintenance periodicity for aeronautical engineering operation determined on the theoretical platform of

subjective analysis / A. V. Goncharenko // XIIIth International Conference "AVIA-2017". (April 19-21, 2017, Kyiv). – Kyiv: National Aviation University, 2017. – pp. 17.29-17.33.

127. Goncharenko A. V. A concept of multi-optional optimality at modeling ideal gas isothermal processes / A. V. Goncharenko // Electronics and control systems. – 2017. – № 2(52). – pp. 94-97.

128. Goncharenko A. V. A diagnostics problem of a-posterior probability determination via Bayes' formula obtained in the multi-optional hybrid functions entropy conditional optimization way / A. V. Goncharenko // Problems of friction and wear. – 2017. – № 4(77). – pp. 95-99.

129. Goncharenko A. V. A hybrid approach to the optimal aeronautical engineering maintenance periodicity determination / A. V. Goncharenko // Proceedings of the NAU. – 2017. – № 3(72). – pp. 42-47.

130. Goncharenko A. V. Aeronautical engineering maintenance periodicity optimization with the help of subjective preferences distributions / A. V. Goncharenko // Proceedings of the NAU. – 2017. – № 2(71). – pp. 51-56.

131. Goncharenko A. V. Aircraft operation depending upon the uncertainty of maintenance alternatives / A. V. Goncharenko // Aviation. – 2017. Vol. 21(4). – pp. 126-131.

132. Goncharenko A. V. An alternative method of the main psychophysics law derivation / A. V. Goncharenko // Clin. and Exp. Psychol. – 2017. – 3: 155. – pp. 1-5. doi: 10.4172/2471-2701.1000155. (ISSN: 2471-2701)

133. Goncharenko A. V. An example of an alternative method of the normal distribution density derivation via a concept of a multi-optional optimality / A. V. Goncharenko // Electronics and control systems. – 2017. – № 3(53). – pp. 95-99. DOI: 10.18372/1990-5548.53.12149 (ISSN: 1990-5548)

134. Goncharenko A. V. Optimal UAV maintenance periodicity obtained on the multi-optional basis / A. V. Goncharenko // 2017 IEEE 4th International Conference "Actual Problems of Unmanned Aerial Vehicles Developments (APUAVD)" Proceedings. – October, 17-19, 2017, Kyiv, Ukraine. – 2017. – pp. 65-68.

135. Goncharenko A. V. An optional hybrid functions method of an ideal gas adiabatic process equation derivation / A. V. Goncharenko // Electronics and control systems. – 2017. – № 4(54). – pp. 109-112.

136. Goncharenko A. V. Exponential distribution density derived with the help of the multi-optional hybrid functions entropy conditional optimization / A. V. Goncharenko // Problems of friction and wear. – 2017. – № 4(77). – pp. 90-94. (ISSN 0370-2197)

137. Goncharenko A. V. Multi-optional hybrid effectiveness functions optimality doctrine for maintenance purposes / A. V. Goncharenko // 14th IEEE International Conference on Advanced Trends in Radioelectronics,

Telecommunications and Computer Engineering (TCSET-2018). – February, 20-24, 2018, Lviv-Slavske, Ukraine. – 2018. – pp. 771-775.

138. Continuing Aircraft Airworthiness (ICAO Doc 9760) : Self-study method guide . Part II . Application of the multi-optional functions entropy doctrine to assess the aircraft maintenance process improvements / compiler: A. V. Goncharenko. – K. : NAU, 2018. – 48 p. http://er.nau.edu.ua/handle/NAU/35891

139. Continuing Aircraft Airworthiness (ICAO Doc 9760) : Self-study method guide . Part I . Reliability measures to assess the aircraft maintenance process improvements / compiler: A. V. Goncharenko. – K. : NAU, 2018. – 48 p. http://er.nau.edu.ua/handle/NAU/35890

140. Continuing Aircraft Airworthiness (ICAO Doc 9760) : Term paper method guide / compiler: A. V. Goncharenko. – K. : NAU, 2018. – 48 p. http://er.nau.edu.ua/handle/NAU/35889

141. Goncharenko A. V. A basic example of the mathematical logics interpretations to the tribological processes characteristics revealing / A. V. Goncharenko // Problems of friction and wear. – 2018. – № 4(81). – pp. 50-53.

142. Goncharenko A. V. Airworthiness support measures analogy to the prospective roundabouts alternatives: theoretical aspects / A. V. Goncharenko // Journal of Advanced Transportation. – Volume 2018 (2018), Article ID 9370597, 7 pages https://doi.org/10.1155/2018/9370597; 2018. – pp. 1-7.

143. Goncharenko A. V. Conceptual optimization in preferable advances of aeroengines blades restoration alternative technology / A. V. Goncharenko // International Research and Practical Conference “The development of technical sciences: problems and solutions”. – April 27-28, 2018. – Brno, the Czech Republic, Volume/Part 3, 2018. – pp. 144-148.

144. Goncharenko A. V. An entropy model of the aircraft gas turbine engine blades restoration method choice / A. V. Goncharenko // International Conference on Advanced Computer Information Technologies (ACIT-2018). – June 1-3, 2018. – Ceske Budejovice, CZECH REPUBLIC, 2018. – pp. 2-5.

145. Goncharenko A. V. Development of a theoretical approach to the conditional optimization of aircraft maintenance preference uncertainty / A. V. Goncharenko // Aviation. – 2018. Volume 22(2). – pp. 40-44.

146. Goncharenko A. V. A multi-optional hybrid functions entropy as a tool for transportation means repair optimal periodicity determination / A. V. Goncharenko // Aviation. – 2018. Volume 22(2). – pp. 60-66.

147. Goncharenko A. V. Aeronautical and aerospace material and structural damages to failures: theoretical concepts / A. V. Goncharenko // International Journal of Aerospace Engineering. – Volume 2018 (2018), Article ID 4126085, 7 pages https://doi.org/10.1155/2018/4126085; 2018. – pp. 1-7.

148. Goncharenko A. V. Concentrations formula conditional optimality with respect to their entropy / A. V. Goncharenko // Problems of friction and wear. – 2018. – № 1(78). – pp. 85-88. (ISSN 0370-2197)

149. Goncharenko A. V. Generalization for the degrading state maximal probability in the framework of the hybrid-optional entropy conditional optimality doctrine / A. V. Goncharenko // Problems of friction and wear. – 2018. – № 1(78). – pp. 89-92. (ISSN 0370-2197)

150. Goncharenko A. V. Initial considerations for the multi-optional doctrine implementation to the aircraft airworthiness support effectiveness estimations / A. V. Goncharenko // Proceedings of The Eighth World Congress "Aviation in the XXI-st Century" "Safety in Aviation and Space Technologies". Kyiv, Ukraine, October 10-12, 2018: матеріали конгр. – Київ, NAU; 2018. – pp. 1.2.1-1.2.5.

151. Goncharenko A. V. Multi-optional doctrine with the uncertainty degree evaluation for the aircraft airworthiness support technologies / A. V. Goncharenko // Proceedings of The Eighth World Congress "Aviation in the XXI-st Century" "Safety in Aviation and Space Technologies". Kyiv, Ukraine, October 10-12, 2018: матеріали конгр. – Київ, NAU; 2018. – pp. 1.2.16-1.2.20.

152. Goncharenko A. V. Neuron model sigmoid activation function based on multi-optional functions entropy conditional optimization doctrine / A. V. Goncharenko // Electronics and control systems: Scientific journal. – Kyiv: Publishing house "Osvita Ukraini", 2018. – № 4(58). – pp. 108-114. DOI: 10.18372/1990-5548.58.13518 (ISSN: 1990-5548)

153. Goncharenko A. V. Optimal controlling path determination with the help of hybrid optional functions distributions / A. V. Goncharenko // Radio Electronics, Computer Science, Control. – 2018. – № 1(44). – pp. 149-158.

154. Goncharenko A. V. Considerations for the aeronautical engineering degrading state probability determination / A. V. Goncharenko // Proceedings of The Eighth World Congress "Aviation in the XXI-st Century" "Safety in Aviation and Space Technologies". Kyiv, Ukraine, October 10-12, 2018: матеріали конгр. – Київ, NAU; 2018. – pp. 1.2.6-1.2.10.

155. Goncharenko A. V. Aeronautical engineering degrading state maximal probability determination as a proof for the hybrid-optional functions entropy conditional optimality doctrine application / A. V. Goncharenko // Proceedings of The Eighth World Congress "Aviation in the XXI-st Century" "Safety in Aviation and Space Technologies". Kyiv, Ukraine, October 10-12, 2018: матеріали конгр. – Київ, NAU; 2018. – pp. 1.2.11-1.2.15.

156. Goncharenko A. V. The Bayes' formula in terms of the multi-optional uncertainty conditional optimality doctrine / A. V. Goncharenko // Proceedings of The Eighth World Congress "Aviation in the XXI-st Century"

"Safety in Aviation and Space Technologies". Kyiv, Ukraine, October 10-12, 2018: матеріали конгр. – Київ, NAU; 2018. – pp. 1.4.34-1.4.38.

157. Goncharenko A. V. Tribological process characteristics on the basis of a neuron activation model obtained through the multi-optional functions entropy doctrine / A. V. Goncharenko // Problems of friction and wear. – 2018. – № 3(80). – pp. 32-35.

158. Goncharenko A. V. Active systems communicational control assessment in multi-alternative navigational situations / A. V. Goncharenko // 2018 IEEE 5th International Conference "Methods and Systems of Navigation and Motion Control (MSNMC)" Proceedings. October, 16-18, 2018, Kyiv, Ukraine. – 2018. – pp. 254-257.

159. Kasianov V. A. Social justice as a subjective analysis category. Numerical estimations / V. A. Kasianov, A. V. Goncharenko // Interdisciplinary Studies of Complex Systems. – 2018. – No 13. – pp. 27-40.

160. Kasianov V. A. Entropy methods of human factor analysis applied to the problem of safety of aviation / V. A. Kasianov, A. V. Goncharenko // Proceedings of The Eighth World Congress "Aviation in the XXI-st Century" "Safety in Aviation and Space Technologies". Kyiv, Ukraine, October 10-12, 2018: матеріали конгр. – Київ, NAU; 2018. – pp. 13.2.14-13.2.18.

161. Kasianov V. A. Social Aspects and Subjective Entropy Paradigm Application to the Problems of Light and Shadow Economy / V. A. Kasianov, A. V. Goncharenko // NAU electronic repository. - http://dspace.nau.edu.ua/handle/NAU/37760 - February 01, 2018. – 15 p.

162. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition). Chapter 10. Heat Capacities / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 12 p.

163. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition). Chapter 9. Calculus Methods / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 6 p.

164. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition). Chapter 8. Law of Energy Conservation in Thermodynamics / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 6 p.

165. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition). Chapter 7. Heat and Work Consideration / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 2 p.

166. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition). Chapter 6. Internal Energy Characteristic of

Thermodynamics / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 2 p.

167. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition). Chapter 5. Thermal Coefficients / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 5 p.

168. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition). Chapter 4. Approaches for a Real Gas Dependencies Derivation / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 19 p.

169. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition). Chapter 3. Theoretical Dependencies for an Ideal Gas / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 7 p.

170. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition). Chapter 2. Basic Considerations of Thermodynamic Processes / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 4 p.

171. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition). Chapter 1. General Characteristic of Thermodynamic System and Heat and Work Mutual Conversions / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 8 p.

172. Goncharenko A. V. Aircraft engines. Lecture notes (first preliminary edition) / A. V. Goncharenko // NAU electronic repository. – http://er.nau.edu.ua/handle/NAU/37936 – March 01, 2019. – 12 p.

173. Goncharenko A. V. A neuron stochastic sigmoid firing function model constructed on the multi-optional functions entropy conditional optimality doctrine / A. V. Goncharenko // Problems of friction and wear. – 2019. – № 1(82). – pp. 58-62. DOI: 10.18372/0370-2197.1(82).13487 (ISSN 0370-2197 print)

174. Goncharenko A. V. Applicability of the multi-optional uncertainty conditional optimality doctrine to the neuron firing model / A. V. Goncharenko // Матеріали XIV міжнародної науково-технічної конференції "ABIA-2019". (23-25 квітня 2019 р., Київ). – К.: НАУ, 2019. – pp. 17.11-17.15.

175. Goncharenko A. V. Example applications of the algebra of logics to the decision making problems of the aircraft airworthiness support technologies (aviation legislation and operational documentation concern) / A. V. Goncharenko // Матеріали XIV міжнародної науково-технічної конференції "ABIA-2019". (23-25 квітня 2019 р., Київ). – К.: НАУ, 2019. – pp. 17.16-17.20.

176. Goncharenko A. V. Optimal optional-hybrid functions distribution for a reliability problem within the “multi-optionality” uncertainty degree evaluation doctrine / A. V. Goncharenko // Матеріали XIV міжнародної науково-технічної конференції “АВІА-2019”. (23-25 квітня 2019 р., Київ). – К.: НАУ, 2019. – pp. 17.6-17.10.

177. Goncharenko A. V. Symmetrical solution for a reliability problem within the multi-optional uncertainty degree evaluation doctrine / A. V. Goncharenko // Матеріали XIV міжнародної науково-технічної конференції “АВІА-2019”. (23-25 квітня 2019 р., Київ). – К.: НАУ, 2019. – pp. 17.1-17.5.

178. Kasianov V. A. Estimation of rating splitting at the final stage of an election campaign based upon the subjective entropy theory / V. A. Kasianov, A. V. Goncharenko // Авіаційна та екстремальна психологія у контексті технологічних досягнень: збірник наукових праць / за заг. ред. Л.В. Помиткіної, Т.В. Вашеки, О.М. Іванської. – К. : ТОВ «Альфа-ПІК», 2019. – pp. 101-107.

179. Kasianov V. A. Alternatives and subjective entropy paradigm context in regards with the conflicts theory / V. A. Kasianov, A. V. Goncharenko // Матеріали XIV міжнародної науково-технічної конференції “АВІА-2019”. (23-25 квітня 2019 р., Київ). – К.: НАУ, 2019. – pp. 37.1-37.5.

180. Kasianov V. A. Dynamical rating forecast / V. A. Kasianov, A. V. Goncharenko // NAU electronic repository. - http://er.nau.edu.ua/handle/NAU/39559 - April 1, 2019. – 12 p.

181. Kasianov V. A. Entropy theory of subjective conflicts (ETSC). some basic provisions / V. A. Kasianov, A. V. Goncharenko // NAU electronic repository. - http://dspace.nau.edu.ua/handle/NAU/37758 - February 15, 2019. – 8 p.

182. Goncharenko A. V. Relative Pseudo-Entropy Functions and Variation Model Theoretically Adjusted to an Activity Splitting / A. V. Goncharenko // 2019 9th International Conference on Advanced Computer Information Technologies (ACIT’2019). – June 5-7, 2019. – Ceske Budejovice, Czech Republic, 2019. – pp. 52-55.

183. Goncharenko A. V. The value of the kinetic reaction order determined based upon the conditional optimality doctrine for the multi-optional functions entropy / A. V. Goncharenko // Problems of friction and wear. – 2019. – № 2(83). – pp. 37-40. DOI: 10.18372/0370-2197.2(83).13690

184. Goncharenko A. V. Hybrid-Optional Effectiveness Functions Entropy Conditional Extremization Doctrine Contributions into Engineering Systems Reliability Assessments / A. V. Goncharenko // Transactions on Aerospace Research. – 2019. – № 2(255). – pp. 90-100. DOI: https://doi.org/10.2478/tar-2019-0012 (ISSN 2545-2835)

185. Goncharenko A. V. Decision making in conditions of multi-alternativeness and uncertainty. Part I / A. V. Goncharenko // NAU Electronic Repository. – http://er.nau.edu.ua/handle/NAU/40249 – June 22, 2019. – 21 p.

186. Goncharenko A. V. Hybrid combined relative pseudo-entropy / A. V. Goncharenko // NAU Electronic Repository. – http://er.nau.edu.ua/handle/NAU/40277 – September 22, 2019. – 8 p.

187. Kasianov V. A. Principle of subjective entropy maximum at the aircraft operation and maintenance staff selection / V. A. Kasianov, A. V. Goncharenko // NAU Electronic Repository. – http://er.nau.edu.ua/handle/NAU/40345 – September 22, 2019. – 8 p.

188. Goncharenko A. V. Decision making in conditions of multi-alternativeness and uncertainty.ppt / A. V. Goncharenko // NAU Electronic Repository. – http://er.nau.edu.ua/handle/NAU/40361 – June 22, 2019. – 54 posters.

189. Goncharenko A. V. The lecture fragment on the certifying staff – maintenance, Licenses A, B [video] / A. V. Goncharenko // NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/38384 – April 09, 2019. – 15:06 minutes.

190. Goncharenko A. V. Main components and stages of the hybrid-optional doctrine development.ppt / A. V. Goncharenko // NAU Electronic Repository. – http://er.nau.edu.ua/handle/NAU/40368 – October 03, 2019. – 55 posters.

191. Kasianov V. A. Theoretical description of military conflicts based upon the subjective entropy paradigm / V. A. Kasianov, A. V. Goncharenko // Матеріали науково-практичної конференції "Філософсько-соціологічні та психолого-педагогічні проблеми підготовки особистості до виконання завдань в особливих умовах". (31 жовтня 2019 р., Київ). – Міністерство оборони України, Національний університет оборони України імені Івана Черняховського. – К.: НУОУ, 2019. – pp. 116-120.

192. Goncharenko A. V. Hybrid relative combined pseudo-entropy function as a tool for a transport system management / A. V. Goncharenko // Electronics and control systems. – 2019. – № 3(61). – pp. 50-54. DOI: 10.18372/1990-5548.61.14220

193. Kasianov V. A. Elements of entropy conflict theory. Applications to the military conflicts / V. A. Kasianov, A. V. Goncharenko // NAU Electronic Repository. – http://er.nau.edu.ua/handle/NAU/40727 – October 31, 2019. – 12 p.

194. Goncharenko A. V. Multi-optional hybridization for UAV maintenance purposes / A. V. Goncharenko // 2019 IEEE 5th International Conference "Actual Problems of Unmanned Aerial Vehicles Developments (APUAVD)" Proceedings. – October, 22-24, 2019, Kyiv, Ukraine. – 2019. – pp. 48-51.

195. Kasianov V. A. Some possible principles of the fast-speed UAV active control systems design / V. A. Kasianov, A. V. Goncharenko // VIII Міжнародна науково-практична конференція «Управління високошвидкісними рухомими об'єктами та професійна підготовка операторів складних систем». (20 грудня 2019 р., Кропивницький). – Кропивницька льотна академія, Національний авіаційний університет. – Кропивницький: Вид-во ЛА НАУ, 2019. – pp. 52-53.

196. Goncharenko A. V. Speedy aircraft horizontal flight maximal distance to duration dilemma / A. V. Goncharenko // VIII Міжнародна науково-практична конференція «Управління високошвидкісними рухомими об'єктами та професійна підготовка операторів складних систем». (20 грудня 2019 р., Кропивницький). – Кропивницька льотна академія, Національний авіаційний університет. – Кропивницький: Вид-во ЛА НАУ, 2019. – pp. 402-406.

197. Goncharenko A. V. Cyber object state maximal probability timing obtained through multi-optional technique / A. V. Goncharenko // Proceedings of the International Workshop on Cyber Hygiene (CybHyg-2019) co-located with 1st International Conference on Cyber Hygiene and Conflict Management in Global Information Networks (CyberConf 2019). November 30, 2019, Kyiv, Ukraine. – 2019. – pp. 132-143. http://ceur-ws.org/Vol-2654/

198. Kasianov V. A. Entropy Theory of Conflicts. Conflict Management: monograph / V. A. Kasianov, A. V. Goncharenko. – Publishing House "LAP LAMBERT Academic Publishing", 2020. – 180 p. (ISBN-13:978-620-2-51558-0)
http://www.morebooks.shop/bookprice_offer_82619b0ca79cbb0662e45c44adfa9650bc33b239?locale=gb¤cy=EUR

199. Kasianov V. A. Entropy theory of conflicts (Presentation of a new monograph) / V. A. Kasianov, A. V. Goncharenko // Індивідуальність у психологічних вимірах спільнот та професій: збірник наукових праць / за заг. ред. Л. В. Помиткіної, О. М. Ічанської. – К. : ТОВ «Альфа-ПІК», 2020. – pp. 49-51.

200. Goncharenko A. V. Cartesian vector direction cosines as the multi-optional hybrid functions optimal distribution / A. V. Goncharenko // Electronics and control systems. – 2020. – № 1(63). – pp. 53-57. DOI: 10.18372/1990-5548.63.14523 (ISSN: 1990-5548)

201. Kasianov V. A. Conceptual Framework of the Entropy Theory of Conflicts: monograph / V. A. Kasianov, A. V. Goncharenko. – Kyiv, Ukraine: NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/42079 – April 02, 2020. – 131 p.

202. Operational Documentation (ICAO Doc 9760) : Self-Study Method Guide . Part I . / compiler: A. V. Goncharenko. – K. : NAU, Electronic

Repository. – 2020. – 38 p. https://er.nau.edu.ua/handle/NAU/35357, Operational_Documentation_(ICAO_9760)_Self_Study_Guide.doc.

203. Goncharenko A. V. Multi-Optional Hybrid Functions Entropy Doctrine Advantages for a State Maximal Probability Determination / A. V. Goncharenko // Transactions on Aerospace Research. – 2020. – № 1(258). – pp. 53-65. DOI: https://doi.org/10.2478/tar-2020-0004, https://content.sciendo.com/view/journals/tar/2020/1/article-p53.xml.

204. Goncharenko A. V. Optimal Price Choice through Buyers' Preferences Entropy [video] / A. V. Goncharenko // The 2020 10th International Conference on Advanced Computer Information Technologies. Deggendorf, GERMANY. – 14 June, 2020. – 15:45 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/43439

205. Goncharenko A. V. The Ant Colony Probabilistic Model Equivalency to the Options Uncertainty Extremized One [video] / A. V. Goncharenko // The 2020 10th International Conference on Advanced Computer Information Technologies. Deggendorf, GERMANY. – 16 June, 2020. – 14:30 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/43537

206. Kasianov V. A. Theory of Conflicts. Entropy Paradigm. Теорія конфліктів. Ентропійна парадигма (англійською мовою): monograph / V. A. Kasianov, A. V. Goncharenko. – Kyiv, Ukraine: Publishing House "Kafedra", 2020. – 172 p. (ISBN: 978-617-7301-78-2)

207. Goncharenko A. V. The User-Preferred Optimal Flight Parameters in an Active Navigational System in a Multi-Alternative Situation / A. V. Goncharenko // Transactions on Aerospace Research. – 2020. – № 2(259). – pp. 1-12. DOI: https://doi.org/10.2478/tar-2020-0006

208. Aerodrome professional practices : self-study method guide . Part I / compiler: A. V. Goncharenko. – K. : NAU, 2020. – 32 p. https://er.nau.edu.ua/handle/NAU/43896, 2_Course_Aerodrome_Professional_Practices_Self_Study_Guide.doc.

209. Scientific research practices : self-study method guide . Part I / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2020. – 33 p. https://er.nau.edu.ua/handle/NAU/44161, 2_Course_Scientific_Research_Practices_Self_Study_Guide.doc.

210. Pre-diploma practices : self-study method guide . Part I / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2020. – 33 p. https://er.nau.edu.ua/handle/NAU/44179, 2_Course_Pre_Diploma_Practices_Self_Study_Guide (1)-перетворено.pdf.

211. Goncharenko A. V. Optimal Price Choice through Buyers' Preferences Entropy / A. V. Goncharenko // 2020 10th International Conference on Advanced Computer Information Technologies (ACIT'2020). – September 16-18, 2020. – Deggendorf, Germany, 2020. – pp. 537-540.

212. Goncharenko A. V. The Ant Colony Probabilistic Model Equivalency to the Options Uncertainty Extremized One / A. V. Goncharenko // 2020 10th International Conference on Advanced Computer Information Technologies (ACIT'2020). – September 16-18, 2020. – Deggendorf, Germany, 2020. – pp. 541-544.

213. Goncharenko A. V. Methodology of applied research. Lectures 1-4 [video] / A. V. Goncharenko // National Aviation University. – 13 October, 2020. – 45:56 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/44514

214. Goncharenko A. V. Two Entropy Theory Wings as a New Trend for the Modern Means of Air Transport Operational Reliability Measure / A. V. Goncharenko // Transactions on Aerospace Research. – 2020. – № 3(260). – pp. 64-74. DOI: https://doi.org/10.2478/tar-2020-0017

215. Goncharenko A. V. Methodology of applied research. Lectures 5-7 [video] / A. V. Goncharenko // National Aviation University. – 04 December, 2020. – 39:41 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/44747

216. Aerohydrogasdynamics and Flight Dynamics. Part I : Aerohydrogasdynamics : Self-Study Method Guide . Part I . Aerohydrogasdynamics . Plotting the Aircraft Polar / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2020. – 57 p. https://er.nau.edu.ua/handle/NAU/44734, Aero_Hydro_Gas_Dynamics_&_Flight_Dynamics_Calculation_&_Graphic_Work_Part_I_Aircraft_Polar.pdf.

217. Аэрогидрогазодинамика и динамика полета. Часть I : Аэрогидрогазодинамика : Методические рекомендации для самоподготовки . Часть I . Аэрогидрогазодинамика . Построение поляры самолета / составитель: А. В. Гончаренко. – К. : НАУ, Электронный репозитарий. – 2020. – 54 с. https://er.nau.edu.ua/handle/NAU/44743, Spoilt_Ukr_Aero_Hydro_Gas_Dynamics_&_Flight_Dynamics_Calculation_&_Graphic_Work_Part_I_Aircraft_Polar.pdf.

218. Гончаренко А. В. Аэрогидрогазодинамика и динамика полета. Введение [видео] / А. В. Гончаренко // Национальный авиационный университет. – 14 декабря, 2020. – 21:19 минуты. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/44768

219. Aerohydrogasdynamics and Flight Dynamics. Part II. A : Flight Dynamics : Self-Study Method Guide . Part II. A . Flight Dynamics . Trajectory Problems. A / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2020. – 66 p. https://er.nau.edu.ua/handle/NAU/44805, Flight_Dynamics_Calculation_&_Graphic_Work_Part_II_A_Trajectory_Problems_A.pdf.

220. Аэрогидрогазодинамика и динамика полета. Часть II. А : Динамика полета : Методические рекомендации для самоподготовки . Часть II. А . Динамика полета . Траекторные задачи. А / составитель: А. В. Гончаренко. – К. : НАУ, Электронный репозитарий. – 2020. – 64 с. https://er.nau.edu.ua/handle/NAU/44889, Spoilt_Ukr_Flight_Dynamics_Calculation_&_Graphic_Work_Part_II_A_Trajectory_Problems_A.pdf.

221. Goncharenko A. V. Operational documentation (ICAO Doc 9760). Lecture 1 [video] / A. V. Goncharenko // National Aviation University. – 02 February, 2021. – 40:26 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/45659, oea-cdzg-fmv (2021-02-02 at 06_15 GMT-8).mp4.

222. Goncharenko A. V. Operational documentation (ICAO Doc 9760). Lecture 2 [video] / A. V. Goncharenko // National Aviation University. – 03 February, 2021. – 47:15 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/45671, evn-qffz-dij (2021-02-03 at 01_39 GMT-8).mp4.

223. Goncharenko A. V. Transport vehicles [videos] / A. V. Goncharenko // National Aviation University. – February, 2021. – NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/45674.

224. Гончаренко А. В. Математичні методи оптимізації процесів технічного обслуговування. Лекції 1, 2 [відео] / А. В. Гончаренко // Національний авіаційний університет. – 08 лютого, 2021. – 01:01:03 хвилин. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/45724, kxo-wqwb-nvi (2021-02-07 at 23_50 GMT-8).mp4.

225. Гончаренко А. В. Математичні методи оптимізації процесів технічного обслуговування. Лекція 3 [відео] / А. В. Гончаренко // Національний авіаційний університет. – 08 лютого, 2021. – 20:02 хвилин. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/45740, fnz-shbz-ngb (2021-02-08 at 03_26 GMT-8).mp4.

226. Гончаренко А. В. Математичні методи оптимізації процесів технічного обслуговування. Практичні заняття 1, 2 [відео] / А. В. Гончаренко // Національний авіаційний університет. – 09 лютого, 2021. – 44:27 хвилин. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/45847, sua-nunh-pwa (2021-02-09 at 01_23 GMT-8).mp4.

227. Гончаренко А. В. Математичні методи оптимізації процесів технічного обслуговування. Домашня робота [відео] / А. В. Гончаренко // Національний авіаційний університет. – 09 лютого, 2021. – 07:56 хвилин. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/45848, sua-nunh-pwa (2021-02-09 at 02_07 GMT-8).mp4.

228. Goncharenko A. V. Mathematical Methods for Optimizing Maintenance Processes. Lectures [video] / A. V. Goncharenko // National Aviation University. – 10 February, 2021. – 01:19:46 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/46542, kbw-jqbr-zvh (2021-02-09 at 23_02 GMT-8).mp4.

229. Goncharenko A. V. Mathematical Methods for Optimizing Maintenance Processes. Practical Classes [video] / A. V. Goncharenko // National Aviation University. – 10 February, 2021. – 42:53 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/46560, eqz-htmz-qfj (2021-02-10 at 03_43 GMT-8).mp4.

230. Goncharenko A. V. Operational documentation (ICAO Doc 9760). Lectures 3, 4 [video] / A. V. Goncharenko // National Aviation University. – 11 February, 2021. – 19:54, 08:06 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/46733, cxg-trzt-rca (2021-02-10 at 23_59 GMT-8).mp4, cxg-trzt-rca (2021-02-11 at 01_28 GMT-8).mp4.

231. Goncharenko A. V. Operational documentation (ICAO Doc 9760). Lecture 5 [video] / A. V. Goncharenko // National Aviation University. – 12 February, 2021. – 24:07 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/46979, qjn-ndkr-wqc (2021-02-12 at 02_42 GMT-8).mp4.

232. Goncharenko A. V. Operational documentation (ICAO Doc 9760). Lectures 6, 7 [video] / A. V. Goncharenko // National Aviation University. – 13 February, 2021. – 23:29 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/46980, pvc-unue-cuu (2021-02-13 at 04_35 GMT-8).mp4.

233. Goncharenko A. V. Operational documentation (ICAO Doc 9760). Instructions on laboratory works [video] / A. V. Goncharenko // National Aviation University. – 13 February, 2021. – 12:31 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/47012, pvc-unue-cuu (2021-02-13 at 05_27 GMT-8).mp4.

234. Goncharenko A. V. Operational documentation (ICAO Doc 9760). Homework instructions [video] / A. V. Goncharenko // National Aviation University. – 13 February, 2021. – 03:48 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/47018, pvc-unue-cuu (2021-02-13 at 05_44 GMT-8).mp4.

235. Goncharenko A. V. Operational documentation (ICAO Doc 9760). Module tests and publications instructions [video] / A. V. Goncharenko // National Aviation University. – 13 February, 2021. – 02:57 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/47013, pvc-unue-cuu (2021-02-13 at 05_50 GMT-8).mp4.

236. Kasianov V. A. Mankiw–Romer–Weil model application to the world SARS COVID-19 pandemic airworthiness support business prospective

evaluation / V. A. Kasianov, A. V. Goncharenko // NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/49865 – April 25, 2021. – 23 p.

237. Goncharenko A. V. Multi-alternativeness entropy application to Ukraine agriculture modern problem concerning land trade [Electronic resource] / A. V. Goncharenko // Аграрна галузь сучасної України: проблеми та перспективи розвитку : зб. матеріалів І Міжнар. наук.-практ. конф., 14 трав. 2021 р. (Слов'янськ, 14 травня, 2021 р.). – Слов'янськ, 2021. – pp. 283-288.

238. Goncharenko A. V. Maximales Landhandelseinkommen zum optimalen Preis bei Zustand der subjektiven Entropie Anwendung [Electronic resource] / A. V. Goncharenko // Аграрна галузь сучасної України: проблеми та перспективи розвитку : зб. матеріалів І Міжнар. наук.-практ. конф., 14 трав. 2021 р. (Слов'янськ, 14 травня, 2021 р.). – Слов'янськ, 2021. – pp. 289-294.

239. Goncharenko A. V. Modeling a land trade conflict situation with the use of the hybrid pseudo-entropy function [Electronic resource] / A. V. Goncharenko // Аграрна галузь сучасної України: проблеми та перспективи розвитку : зб. матеріалів І Міжнар. наук.-практ. конф., 14 трав. 2021 р. (Слов'янськ, 14 травня, 2021 р.). – Слов'янськ, 2021. – pp. 295-300.

240. Kasianov V. A. Light and shadow problems of entrepreneurship in terms of subjective entropy paradigm [Electronic resource] / V. A. Kasianov, A. V. Goncharenko // Digitalization of the economy as a factor of sustainable development : Materials of International scientific-practical conference (Mariupol, May 25–26, 2021 y.). – Mariupol, 2021. – pp. 203-205. – Mode of access: http://eir.pstu/handle/123456789/31707

241. Goncharenko A. V. Maximal income in three alternative case with the optimal price and amount of the land trade [Electronic resource] / A. V. Goncharenko // Digitalization of the economy as a factor of sustainable development : Materials of International scientific-practical conference (Mariupol, May 25–26, 2021 y.). – Mariupol, 2021. – pp. 197-198. – Mode of access: http://eir.pstu/handle/123456789/31704

242. Goncharenko A. V. Optimal distribution of subjective preferences for the alternatives of the land trade prices [Electronic resource] / A. V. Goncharenko // Digitalization of the economy as a factor of sustainable development : Materials of International scientific-practical conference (Mariupol, May 25–26, 2021 y.). – Mariupol, 2021. – pp. 196-197. – Mode of access: http://eir.pstu/handle/123456789/31703

243. Goncharenko A. V. Ocean heat transport simulation model based upon the doctrine of the conditional optimization of the hybrid functions entropy / A. V. Goncharenko // NAU Electronic Repository. – National Aviation University. – Kyiv, Ukraine, 2021. – https://er.nau.edu.ua/handle/NAU/51021 – June 07, 2021. – 14 p.

244. Goncharenko A. V. Anwendung einer Multialternativitäts-Entropie auf ein modernes Problem der Ukraine-Landwirtschaft für den Landhandel / A. V. Goncharenko // Elektronisches Archiv. – Nationale Luftfahrtuniversität. – Kiew, Ukraine, 2021. – https://er.nau.edu.ua/handle/NAU/51054 – Juni 09, 2021. – 14 S.

245. Goncharenko A. V. Hybrid functions entropy conditional optimization model for ocean heat transport in climate change simulation [Electronic resource] / A. V. Goncharenko // The impact of climate change on spatial development of Earth's territories: implications and solutions: Materials of the 4nd International Scientific and Practical Conference (Kherson, June 10–11, 2021). – Kherson, 2021. – pp. 122-126.

246. Goncharenko A. V. Initial Theses for Buyers' Preferences Optimality of the Price Choice in Uncertainty [video] / A. V. Goncharenko // The 2021 11th International Conference on Advanced Computer Information Technologies. Deggendorf, GERMANY. – 17 August, 2021. – 02:12 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/52283

247. Goncharenko A. V. Maximum of the Objective Functional and Basis Price Interpretation in the Entropy Paradigm Framework [video] / A. V. Goncharenko // The 2021 11th International Conference on Advanced Computer Information Technologies. Deggendorf, GERMANY. – 17 August, 2021. – 07:42 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/52284

248. Goncharenko A. V. Domestic Farmers Protection by Queuing [video] / A. V. Goncharenko // The 2021 11th International Conference on Advanced Computer Information Technologies. Deggendorf, GERMANY. – 17 August, 2021. – 04:40 minutes. NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/52285

249. Goncharenko A. V. A Two-Point Approximation Approach to Determining Aircraft Aerodynamic Force Coefficients for a Maximal-Duration Horizontal Flight / A. V. Goncharenko // Transactions on Aerospace Research. – 2021. – № 3(264). – pp. 71-80. DOI: https://doi.org/10.2478/tar-2021-0018

250. Goncharenko A. V. Preferences Entropy Conditional Maximum in the Case of the Buyers' Optimal Preferences Distribution for the Price Choice / A. V. Goncharenko // 2021 11th International Conference on Advanced Computer Information Technologies (ACIT-2021). – September 15-17, 2021. – Deggendorf, Germany, 2021. – pp. 23-26. DOI: 10.1109/ACIT52158.2021.9548569

251. Goncharenko A. V. Two Scenarios of the Same Income Obtaining / A. V. Goncharenko // 2021 11th International Conference on Advanced Computer Information Technologies (ACIT-2021). – September 15-17, 2021. – Deggendorf, Germany, 2021. – pp. 27-30. DOI: 10.1109/ACIT52158.2021.9548545

252. Kasianov V. A. Subjective analysis theory application to the transport system management optimization in conditions of available alternatives preferences uncertainty / V. A. Kasianov, A. V. Goncharenko // NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/53460 – September 18, 2021. – 34 p.

253. Goncharenko A. V. Ein besonderer Fall von dynamischer Informationsunterstützung und Präferenzen entropiebedingter Optimierung für das Luftverkehrsmanagement: Theoretischer Aspekt / A. V. Goncharenko // Elektronisches Archiv. – Nationale Luftfahrtuniversität. – Kiew, Ukraine, 2021. – https://er.nau.edu.ua/handle/NAU/53476 – Dezember 22, 2021. – 27 S.

254. Goncharenko A. V. Simulación numérica para la gestión del transporte aéreo, información dinámica y alternativas de comunicación preferencias, entropía optimalidad condicional / A. V. Goncharenko // Repositorio Electrónico. – Universidad Nacional de Aviación. – Kiev, Ucrania, 2021. – https://er.nau.edu.ua/handle/NAU/53523 – diciembre 28, 2021. – 27 p.

255. Goncharenko A. V. Solving a Certain Two-Alternative Problem in the Optimal Organization of Aviation Transportation in Conditions of Uncertainty / A. V. Goncharenko // Transactions on Aerospace Research. – 2022. – № 1(266). – pp. 66-74. DOI: https://doi.org/10.2478/tar-2022-0005

256. Goncharenko A. V. Specific Case of Two Dynamical Options in Application to the Security Issues: Theoretical Development / A. V. Goncharenko // International Journal of Computer Network and Information Security (IJCNIS). – 2022. – Vol. 14, No. 1, 08 Feb. 2022. – pp. 1-12. DOI: 10.5815/ijcnis.2022.01.01. MECS (http://www.mecs-press.org/)

257. Goncharenko A. V. Variations of the Information Processing Functions for the Air Transport Management in Conditions of the Operational Uncertainty / A. V. Goncharenko // 2022 IEEE 16th International Conference on Advanced Trends in Radioelectronics, Telecommunications and Computer Engineering (TCSET-2022). – February 22-26, 2022. – Lviv-Slavske, Ukraine, 2022. – pp. 139-142. doi: 10.1109/TCSET55632.2022.9766848

258. Goncharenko A. V. Dilemme de l'optimisation extensive ou intensive des options en matière de gestion du transport aérien dans l'incertitude : considérations théoriques / A. V. Goncharenko // Dépôt électronique. – Université nationale de l'aviation. – Kiev, Ukraine, 2022. – https://er.nau.edu.ua/handle/NAU/54547 – 07 avril 2022. – 15 p.

259. Goncharenko A. V. Entropy Modeling of Optimal Intelligence Development in Regards with the Air Transport Operation / A. V. Goncharenko // Proceedings of The Fifth International Workshop on Computer Modeling and Intelligent Systems (CMIS-2022). – May 12, 2022. – Zaporizhzhia, Ukraine, 2022. – pp. 200-210. http://ceur-ws.org/Vol-3137/paper17.pdf

260. Goncharenko A. V. A Material Tolerable State Maximum Probability Timing: The Elements of the Uncertainty Measure Conditional Optimization Doctrine / A. V. Goncharenko // Materials Science Forum. – June 17, 2022. – Vol. 1064, pp. 157-163. Trans Tech Publications, Ltd. https://doi.org/10.4028/p-18y096

261. Goncharenko A. V. Modeling an Aircraft Maximum Endurance Horizontal Flight for Air Trials / A. V. Goncharenko // Aviation. – 2022. Volume 26(2). – pp. 89-95. DOI: https://doi.org/10.3846/aviation.2022.16920

262. Goncharenko A. V. Un formalismo basato sull'entropia soggettiva applicata alle funzioni opzionali di misura del supporto all'aeronavigabilità dell'aeromobile/ A. V. Goncharenko // Archivio elettronico. – Università Nazionale dell'Aviazione. – Kyiv, Ucraina, 2022. – https://er.nau.edu.ua/handle/NAU/56233 – 03 settembre 2022. – 24 p. Milano_Formalism_2022_NAU_Repository.pdf

263. Transport Vehicles Operation. Part I : Number of Transport Vehicles : Self-Study Method Guide . Part I . Number of Transport Vehicles . Optimal Choice Dilemma / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2022. – 48 p. https://er.nau.edu.ua/handle/NAU/56234, Method_Guide.pdf.

264. Goncharenko A. V. Air transport policy and planning. Lectures [videos] / A. V. Goncharenko // National Aviation University. – September, 2022. – NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/56468

265. Goncharenko A. V. Air transport policy and planning. Lectures [audio records] / A. V. Goncharenko // National Aviation University. – September, 2022. – NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/56487

266. Goncharenko A. V. Subjective analysis concept general description [video] / A. V. Goncharenko // The X-th World Congress “Aviation in the XXI-st Century” “Safety in Aviation and Space Technologies”. Kyiv, Ukraine. – 28 September, 2022. – NAU Electronic Repository. – https://er.nau.edu.ua/handle/NAU/56613

267. Goncharenko A. V. Simulation on the Aircraft Engine By-Pass Ratio Optimization in Regards with the Number of the Passengers on Board / A. V. Goncharenko // 2022 12th International Conference on Advanced Computer Information Technologies (ACIT-2022). – September 26-28, 2022. – Ruzomberok, Slovakia, 2022. – pp. 294-297. DOI: 10.1109/ACIT54803.2022.9913134.

268. Навчально-методичний комплекс навчальної дисципліни" Інноваційні методи прийняття рішень в соціотехнічних та соціокультурних системах" / Д. О. Шевчук, А. В. Гончаренко. – К. : Національний авіаційний університет, – 2022. – 14 с.

269. Goncharenko A. V. The concept of optimal behavior of a cyber object as a measure of its generalized uncertainty / A. V. Goncharenko // CEUR Workshop Proceedings, 2022, 3530, pp. 1–10. https://ceur-ws.org/Vol-3530/paper1.pdf. https://ceur-ws.org/Vol-3530/.

270. Goncharenko A. V. Basic Theoretical Provisions of Entropy Approach for Intelligent Air Transportation Management / A. V. Goncharenko // Proceedings of The Sixth International Workshop on Computer Modeling and Intelligent Systems (CMIS-2023). – May 03, 2023. – Zaporizhzhia, Ukraine, 2023. – pp. 1-10. https://ceur-ws.org/Vol-3392/paper1.pdf

271. Kasianov V. A. The Simplest Models of the Macroeconomics Dynamics in a Composition with the Principle of the Subjective Entropy Maximum / V. A. Kasianov, A. V. Goncharenko // Transactions on Aerospace Research. – 2023. – № 1. – pp. 10-21. DOI: https://doi.org/10.2478/tar-2023-0002

272. Goncharenko A. V. Elements of the Cognitive Technologies Application to the Problems of the Air Transport Management as a Socio-Technical System / A. V. Goncharenko // Proceedings of the International Workshop on Advances in Civil Aviation Systems Development. ACASD 2023. – May 29-31, 2023. – Kyiv, Ukraine. Lecture Notes in Networks and Systems, vol 736. Springer, Cham. – pp. 301-310. https://doi.org/10.1007/978-3-031-38082-2_23

273. Scientific research practices: self-study method guide. Part I. / compiler A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 42 p. https://er.nau.edu.ua/handle/NAU/59806, Scientific_Research_Practices_Self_Study_Guide.pdf.

274. Kasianov V. A. Development of the Airline Business Macroeconomics Dynamics Models / V. A. Kasianov, A. V. Goncharenko // Transactions on Aerospace Research. – 2023. – № 2. – pp. 25-32. DOI: https://doi.org/10.2478/tar-2023-0009

275. Transport Vehicles Operation. Part II: Elementary Supply Chain Optimization : Self-Study Method Guide . Part II / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 53 p. https://er.nau.edu.ua/handle/NAU/62062, II_TVO_SSG.pdf.

276. Transport Vehicles Operation. Part III : Elementary Optimal Supply Speed : Self-Study Method Guide . Part III / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 53 p. https://er.nau.edu.ua/handle/NAU/62139, III_TVO_SSG.pdf.

277. Transport Vehicles Operation. Part IV : Optimal Number of Transport Vehicles : Self-Study Method Guide . Part IV / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 57 p. https://er.nau.edu.ua/handle/NAU/62141, IV_TVO_SSG.pdf.

278. Transport Vehicles Operation. Part V: The Simplest Problem of the Probability of a Choice : Self-Study Method Guide . Part V / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 54 p. https://er.nau.edu.ua/handle/NAU/62159, V_TVO_SSG.pdf.

279. Transport Vehicles Operation. Part VI : The Simplest System Reliability : Self-Study Method Guide . Part VI / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 55 p. https://er.nau.edu.ua/handle/NAU/62201, VI_TVO_SSG.pdf.

280. Transport Vehicles Operation. Part VII : The Simplest Random Process : Self-Study Method Guide . Part VII / compiler: A. V. Goncharenko. – K. : NAU, Electronic Repository. – 2023. – 61 p. https://er.nau.edu.ua/handle/NAU/62243, VII_TVO_SSG.pdf.

Навчальне видання

ЕКСПЛУАТАЦІЯ ТРАНСПОРТНИХ ЗАСОБІВ

Частина VIII

ОПТИМАЛЬНІСТЬ СУБ'ЄКТИВНИХ ПЕРЕВАГ

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до виконання самостійної роботи
для студентів 2-го курсу галузі знань 27 «Транспорт»,
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(Англійською мовою)

Укладач ГОНЧАРЕНКО Андрій Вікторович

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Технічний редактор *А. І. Лавринович*
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