

NEW SCIENTIFIC DIRECTION: METHODS OF OPERATIVE RATIONAL REINSURANCE OF ESPECIALLY SERIOUS RISK ON THE BASIS OF THE EVOLUTIONARY ALGORITHMS

Sheptunov M.V.

Various scientific directions are developed in the world. The new important directions of a science, technologies and engineering are formed in Russia and in other countries. Significant interest from the different positions represents: alive systems, information telecommunication systems, management of risk in technical and in socio-economic systems, economy of the resources and others.

for the first variant of reinsurance

$$SSO_c = f_{bc}(SSO_b), SSO_d = f_{cd}(SSO_c, SSO_b), SSO_e = f_{de}(SSO_d, SSO_c, SSO_b),$$

for the second variant of reinsurance

$$SSO_d = f_{bd}(SSO_b), SSO_e = f_{de}(SSO_d, SSO_b), \dots,$$

for the third variant of reinsurance

$$SSO_c = f_{bc}(SSO_b), SSO_e = f_{ce}(SSO_c, SSO_b), \dots,$$

and so on,

where $SSO_c, SSO_b, SSO_d, SSO_e$ are the sums of the planned insurance responsibility by reinsurers c, b, d, e accordingly,

$f_{bc}, f_{cd}, f_{de}, f_{bd}, f_{ce}$ are some functions reflecting "rating" of the reinsurers on the relation to each other and known for them.

The ratings of the reinsurers, expressed by the mentioned functions, can carry objective or subjective character.

It is important, that at the significant number of the members of insurance group the efficiency of acceptance of the decisions is rather urgent.

The considered difficult task can be shown to the modified traveling salesman problem having distinguished economic sense in view of a subject domain of reinsurance.

It is necessary to note, that total of variants of ways of detour in the classical traveling salesman

The aim of the scientific message is informing of a scientific public on the new scientific direction, based by the author. This direction leans on both to area of reinsurance, and to area of information technologies. It can be correctly named "the methods of the operative rational reinsurance of the especially serious risk based on the evolutionary algorithms".

Let's consider the following economic problem. Let, for example, an insurance group with reinsurer includes together five members. Let, in particular, a is insurer, b, c, d, e are reinsurers. Also, let SSO is a sum of the insurance responsibility of the every-one subsequent reinsurer, being a part of conditions of the insurance contract, depends on a "rating" of the previous reinsurers – in eyes of everyone subsequent reinsurer:

problem represents $n!$. And n is the number of points of the detour (number of towns).

From positions of the graph theory a classical traveling salesman problem is known as a task of search of the minimal length of the Hamilton cycle.

In particular, $10! = 3628800$; $12! = 479001600$. In case of a total search of variants at $n = 15$ and more points the given task is unsolvable even for one year (!) at computer calculations.

Also at the significant amount of towns frequently applies a method of branches and borders promoting reduction of amount of variants of the search. However, the given method does not guarantee, that during the decision of a task will not be made total search of variants.

The task, considered in the message, is characterized by distinguished criterion function

$$x_k^{safe} = \left(S - \sum_{q=1}^{n-1} SSO_q \right) \rightarrow \min,$$

where x_k^{safe} is the required acceptable sum of the insurance responsibility of the insurer,

S is the sum, on which is insured risk by the insurer a at the subsequent reinsurance,

q is the number of the edge according with the order of detour of the graph, in which the all n members of

the insurance group are represented by tops of the graph,

SSO_q is the sum of the insurance responsibility of the q -th member of the insurance group at approach of the insurance occasion, $k = \overline{1, (n-1)}$,

$q = \overline{1, (n-1)}$.

The using of this criterion is caused by characteristic situations, in which the insurance company not aspires to a significant prize at reinsurance of a serious risk so much, how many does not wish to go bankrupt owing to the insurance occasion.

It is represented to perspective exertion of evolutionary (genetic, ant algorithms and other) algorithms of functional optimization for the decision of similar tasks connected to operative search of rational variants of reinsurance of the especially serious risk. *Result is the creation of the new scientific direction on a joint of the realm of reinsurance and the realm of information technologies, namely: methods of operative rational reinsurance of especially serious risk on the basis of the evolutionary algorithms.*

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THE SIMILARLY CHARGED POLYELECTROLYTES' MULTICOMPONENT SYSTEMS AGGREGATE CAPABILITY

Zubeva Yu.S., Malysheva Zh.N.
Volgograd State Engineering University
Volgograd, Russia

The high – molecular compounds aggregate capability study, having resulted in the disperse phase sedimentationally unstable state, is being presented the obviously scientific and the practically real interest at the dispersions destabilization processes examination. The individual flocculants use just in the compound

multi – component dispersions is not being permitted to achieve the high level efficiency of the dispersions division in the majority of the cases. Therefore, the use bases development of the cationic polyelectrolytes composition is being presented the perspective direction just in this field of the researches.

The aggregate capability of the cationic polyelectrolytes compositions peculiarities finding, on the basis of the kinetic stability analysis of the model kaolin aqueous suspension and the activated sludge structure formation processes is the work's aim.

The industrially produced brands' cationic polyelectrolytes: CF – 91, VPC – 402, CF – 99 and Praestol – 650 have been used, as the flocculants' specimens. The flocculation kinetics have been investigated by the turbidimetric method on the model kaolin aqueous suspension (e.g. the KSD brand with the 18 mkm particles' average size) with the 0,8 mass % disperse phase concentration. The D optical density has been measured at the UNICO 1201 spectrophotometer.

The synergism effect has been discovered, in the result of the RE binary and the ternary mixtures aggregate capability investigation for the compositions' most part. The more polymers' differences by their chemical constitution, the more probable synergistic result display at such reagents use just in the mixture.

The final results of the carried out experimental – industrial tests on the compacted surplus activated sludge dehydration just at the biological treatment facilities in the city of Volgograd have been shown, that the received flocculants' binary mixtures introduction is, noticeably, being lowered just the structure formation critical concentration and also the suspended matters content just in the filtrate.

Thus, the correlation between the data on the kaolin suspension flocculation kinetics and the activated sludge's structural and mechanical characteristics just at the compositions from the cationic polyelectrolytes introduction has already been revealed.

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