Category model of the probabilities theory for intellectual tutoring system

© N.S. Vasilyev

Bauman Moscow State Technical University, Moscow, 105005, Russia

The age of high technologies and innovations (the third scientific technical revolution) has drastically changed human activity. The time of system informational culture has come. The changes challenge education system to train specialists who are able for the expansion and system work. It is impossible to do it without true general notions. In full measure it concerns engineers' tutoring.

Without achieving mathematical culture it is impossible to become familiar with the system world. Mathematics gives us necessary tools to study and to compare systems on the base of category language. Intellectual tutoring systems (ITS) which are developing now can support continuous tutoring process in the third world of the noosphere on the base of Internet and modern informational technologies. Universal education can facilitate the work. Making familiar with the category language (language of systems) is one of the main purposes of the education. It becomes also necessary for scientific communication. Innovation in reform of education is using of ITS in traditional tutoring.

Category language is used in ITS as means of general sense expression. Without the language it becomes impossible to describe the whole world of noosphere knowledge. In any tutoring course there are specialized universal category constructions. They give frame of the rational knowledge. Education on the base of universal constructions aids to form student's system representations and develops cognitive activity.

Applied in ITS category an approach is described by an example of the theory of probabilities. Category model of the probabilities theory is investigated under the name of random variables category. Existence of the generatrix, monomorphism and isomorphism equivalence, characteristic property of discreet random variables and weak universality of the random variables independence notion are proved. Category sense of Kolmogorov's theorem is analyzed.

Vasilyev N.S. graduated from Lomonosov Moscow State University in 1974. Dr.Sci. (Phys.&Math.), Professor of the Higher Mathematics Department at Bauman Moscow State Technical University. Author of over 80 research papers on optimal management, calculus mathematics, theory of optimization, operations research, information science. He took up parallel computing and mathematical modelling of packet data networks. At present sphere of his scientific interests includes creation problems of intelligence learning systems. e-mail: nik8519@yandex.ru