Gagarin Yu. E., Stepovich M. A. (Kaluga, Russia) — **Interval estimation of the probability of error in the classification of objects with stochastic data.**

To classify objects, we apply the Bayesian criterion, which provides the minimum level of error. We assume that there are no losses if the correct solution is chosen when observing a specific value x of the trait and losses are rare if the solution is incorrect. Under such conditions, the probability of classification error is determined by:

$$P(e) = 1 - \sum_{j=1}^{M} \int\limits_{R_j} \eta_j(x, \mathbf{\Theta}) dx,$$

where $\eta_j(x, \mathbf{\Theta}) = P(x\,|\omega_j) P(\omega_j)$, $\mathbf{\Theta}$ — vector of parameters; R_j — the area in the attribute space corresponding to ω_j the object; M — number of objects.

The values of attributes x_i, $i = \overline{1,\ n}$ are the results of specific experiments, and how any measurements contain random errors that need to be considered. The values of the functions $\eta_j(x,\ \mathbf{\Theta}) \pm \Delta\eta_j(x,\ \mathbf{\Theta})$ will have an error $\Delta\eta_j(x,\ \mathbf{\Theta})$, taking into account which areas R_j will not be determined uniquely. More accurate is the formula that takes into account random errors of the source data:

$$P(e) \pm \Delta P(e) = 1 - \sum_{j=1}^{M} \int\limits_{R_j \pm \Delta R_j} \left[\eta_j(x,\ \mathbf{\Theta}) \pm \Delta\eta_j(x,\ \mathbf{\Theta})\right]\ dx.$$

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