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# Confidence interval estimation for quality factors of binary classifiers – ROC curves, AUC for small samples

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*Polynomial distribution being presented as conditional joint distribution of independent Poisson random variables we build confidence intervals for sum polygons based on grouped data. We then use these estimates to build confidence intervals for ROC curves. These estimations then could be used in automatic defect detection and quality control procedures to find and to identify inhomogeneities and anomalies in structure of constructional materials and their elements for the end to improve robustness and efficiency of these procedures for small samples.*

**Keywords:** *confidence intervals, sum polygons, connection between polynomial distribution and Poisson distribution, ROC curves, binary classifiers.*

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