University of Rijeka, Faculty of Maritime studies

PROJECT ACRONYM AND TITLE: Standard classification methods and their problem of the number of classes selection during the machine learning from the data in absence of the specific knowledge

FUNDING PROGRAMME: University of Rijeka (UNIRI Young Scientists' Projects 2023)

PERSON RESPONSIBLE: Assist. Prof. Robert Baždarić, PhD

FINANCIAL DATA

Project total cost	Overall funding assigned to PFRI
5000 EUR	5000 EUR

SUMMARY

Very well-known and standard statistically based classification methods traditionally have the problem of primary selection of the number of classes. In databases, for a wider range of different researches, the problem escalates to a perplexing problem of reliability of modern AI modelling based on weak preliminary arguments. Many researches, especially those that nowadays use machine learning as a modern approach, e.g., in mathematical modelling of nonlinear systems or in learning from visual sensors images, run into the problem of special knowledge that helps machine learning to converge to the optimum solution when learning and to avoid a local minimum. Apart from the local minimum, there is a lot of uncertainty in the choice of the main task we give to the learning algorithms. If we take an example from the field of nonlinear dynamic problems and dense modelling of nonlinearity using artificial intelligence (AI), or if we take the detection of artefacts in medical diagnosis using AI, the question is how much human intervention should be in the initial conditions of our machine learning, especially when we learn from data about which we have no specific knowledge. K-means classification as a basic tool for primary selection of the number of classes cannot help, nor can using advanced algorithms for preliminary selection of centroids for the type of data we are pointing to. Research needs to move in the direction of using fuzzy logic in the selection of major groups and not just in learning mechanisms. Human predictions are inappropriate for this type of data in the qualitative sense, but they can be very helpful in the quantitative sense of learning from the data. The use of fuzzy logic as a modern algebra can help in the development of quantitative data patterns. The study aims to provide a new perspective on the problem of preliminary classification in unsupervised machine learning, focusing on learning from medical data.

Start date	End date
02.04.2024.	01.04.2025.

WEBSITE: -

ADDITIONAL INFO:

Project team members:

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