

Self-organizing Scientific Databases and Related Applications in Automated Development of Online Assignments

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High-quality scientific data, explaining abstract scientific concepts, and structures depicting the relationships between these concepts are very important for improving the quality of online learning. The process of collecting scientific concepts and creating relationships between them can be automated using statistical correlations, large language models, Boolean logic, multi-valued logic, and many other techniques. In order to effectively store scientific data and their mutual relations, it is necessary to develop and use appropriate data structures. The process of optimizing the structure of scientific databases can be automated, leading to the development of self-organizing systems. The presented research topic was partly inspired by the cooperation with the ISO standardization committee. The results of this research have been applied in the development of the online learning system.