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Aggregation in evaluation of computer-assisted assessment. (English) [Zbl 1067.68143](#)

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This Ph.D. thesis presents a framework for gradual automatic evaluation of a student's answer that can be viewed as part of an e-learning system. The basic idea is to introduce an evaluation concept based on fuzzy equivalence relations (called T-equivalence relations), and to use partial evaluations to determine the final result. A short overview of basic principles of computer-assisted assessment is given, and the importance of the feedback in self-directed learning and of different types of questions is discussed. It is shown that the evaluation of answers to these questions is most often based firstly on an evaluation at each subitem's level, and secondly on an aggregation process. Aggregation operators and their properties are discussed in length. T-equivalence relations are used to determine the similarity between a given answer and the correct answer. The evaluation process is first carried out on single questions or single subitems, and then similarities on an overall level are computed by applying an aggregation process. It is discussed how to guarantee that the aggregation process is handled correctly. It is stated that the results reported in this thesis are not limited to applications in computer-assisted assessment, but can be extended to other fields such as evaluation of data sets based on prototypes and decision-making systems based on the aggregation of fuzzy relations.

Reviewer: [Neli Zlatareva \(New Britain\)](#)

MSC:

- [68T35](#) Theory of languages and software systems (knowledge-based systems, expert systems, etc.) for artificial intelligence
- [68T20](#) Problem solving in the context of artificial intelligence (heuristics, search strategies, etc.)
- [68-02](#) Research exposition (monographs, survey articles) pertaining to computer science
- [97C40](#) Intelligence and aptitudes (aspects of mathematics education)

[Cited in 7 Documents](#)

Keywords:

[computer-assisted assessment](#); [fuzzy relations](#); [aggregation operators](#); [triangular norms](#)