

Algebraic Expressions with Uncertain Syntax and Their Applications in Online Learning

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Answers provided by users of online learning systems may contain a lot of mistakes. There are incorrect/unnecessary/missing/misspelled arithmetic operators, constants, symbols, parentheses, function names, variable names, and expressions in domain specific language. To improve quality of teaching it is possible to study multiple interpretations of arithmetic expressions.

Various interpretations can be used to construct possible suggestions for the users which may improve quality of teaching. Interaction with the online learning system may enhance the learning process. Presented methodology can be also used to assign partial credits.

In some cases, uncertain expressions can be described by syntax trees and postfix/prefix expressions with uncertain values (interval, set-valued, fuzzy, probability distribution, etc.).

Partially correct mathematical expressions, imprecise information, datasets with missing values can be used to construct mathematical descriptions of scientific problems in precise or imprecise form. Presented methodology can be applied in autonomous development of science.