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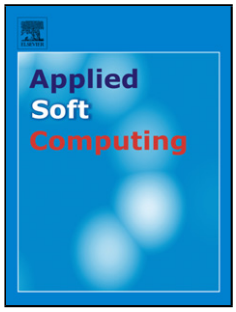


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# Uncertainty management in Software effort estimation using a consistent fuzzy analogy-based method

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**Highlights**

- **New Consistent Fuzzy Analogy Based Software Effort Estimation is proposed to better managing for uncertainty in software effort estimation environment.**
- **The quality of software drivers is enhanced using a consistent fuzzy representation.**
- **The must specific possibility distribution of possible effort values can take a new project is computed to quantify the uncertainty and manage risks in the estimated effort.**
- **The new estimation model derive both the fuzzy estimation and the crisp estimation.**
- **An experiment studies is performed to evaluate the accuracy of the new estimation model and the significant difference to comparison methods.**

**Abstract**

*Software effort estimation is a critical task in software project development management. Unfortunately, the uncertainty and inaccuracy are inherent properties of the software effort estimation environment. These are caused by the limited capabilities of the managers, to foresee, measure and describe factors influencing the software effort. The promising Fuzzy Analogy-based Software Effort Estimation model (FASEE) employs successfully fuzzy logic with approximate reasoning theory to handle imprecision and reasoning under uncertainty. Also, FASEE use possibility distribution to quantify the uncertainty in the estimate that aid the software managers to assess risks. Yet, the FASEE suffer from the low data quality and the uncertainty induced in the reasoning process. In this paper, we propose an enhancement of the FASEE, by imposing consistency criteria to deal with the aforementioned drawbacks. So, the underlying model, called Consistent Fuzzy Analogy-based Software Effort Estimation (C-FASEE) is endowed with two capabilities. The first one introduces consistency criteria in attribute representation by fuzzy sets to enable fitting each attribute to the software effort. The second one introduces a new relation of confidence to measure the extent that the resulted most similar projects respect the assumption "similar projects have similar efforts". Moreover, the C-*

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