

Adaptable Models for Systems and Software Size Estimation

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Abstract:

Currently, modern society depends on software systems. Many software systems development projects fail or are unfinished on time and budget. Project management is challenged with fast changes in projects objectives, constraints, or priorities. Changes in project size are necessary due to changes in competitive threats, technology, organizations, leadership priorities, and environments. It is thus infeasible to provide precise effort and cost estimates using a known size and cost estimation methods. The known algorithmic approaches for the software development effort and cost needs reflect the new phenomena. The premise of our research is to build on prior research an unconventional hybrid estimation model, which will be able to adapt to changing project features and available project characteristics; designing a hybrid adaptive approach to a multi-criteria estimation model.

The proposal is based on hypothesis, that size estimation model, which is based on adaptability and model selection methods will produce more accurate estimation when compared to the state of Art (conventional models). The important part of proposed hybrid models is historical project data analysis, feature selection and their analysis. The ability of adaptability, which is based on the similarity between projects, will use features' set (dependent variables) unique to specific problem domain for model selection.

Research objectives:

A feature-specific model improves the accuracy of the estimation (size estimation, effort estimation or cost estimation)

Investigation of a hybrid approach, which will allow creating a problem domain specific algorithm with automatic feature selection

Literature:

[1] F. González-Ladrón-de-Guevara, M. Fernández-Diego, and C. Lokan, "The usage of ISBSG data fields in software effort estimation: A systematic mapping study," *Journal of Systems and Software*, vol. 113, pp. 188-215, 2016.

[2] G. Robiolo and R. Orosco, "Employing use cases to early estimate effort with simpler metrics," *Innovations in Systems and Software Engineering*, vol. 4, no. 1, pp. 31-43, 2008.

[3] G. Karner, "Metrics for objectory", December 1993, Diploma, University of Linköping, Sweden, No," LiTH-IDA-Ex-9344, vol. 21, 1993.

[4] S. Azevedo, R. J. Machado, A. Bragança, and H. Ribeiro, "On the refinement of use case models with variability support," *Innovations in Systems and Software Engineering*, vol. 8, no. 1, pp. 51-64, 2011.

[5] M. R. Braz and S. R. Vergilio, "Software effort estimation based on use cases," in *Computer Software and Applications Conference, 2006. COMPSAC'06. 30th Annual International, 2006*, vol. 1, pp. 221-228: IEEE.