

Cognitive Weighted Polymorphism Factor: A New Cognitive Complexity Metric

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Abstract : Polymorphism is one of the main pillars of the object-oriented paradigm. It induces hidden forms of class dependencies which may impact software quality, resulting in higher cost factor for comprehending, debugging, testing, and maintaining the software. In this paper, a new cognitive complexity metric called Cognitive Weighted Polymorphism Factor (CWPF) is proposed. Apart from the software structural complexity, it includes the cognitive complexity on the basis of type. The cognitive weights are calibrated based on 27 empirical studies with 120 persons. A case study and experimentation of the new software metric shows positive results. Further, a comparative study is made and the correlation test has proved that CWPF complexity metric is a better, more comprehensive, and more realistic indicator of the software complexity than Abreu's Polymorphism Factor (PF) complexity metric.

Keywords : cognitive complexity metric, object-oriented metrics, polymorphism factor, software metrics

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