

# Are Unit and Integration Test Definitions Still Valid for Modern Java Projects? An Empirical Study on Open-Source Projects

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**Abstract:** We summarize the article *Are unit and integration test definitions still valid for modern Java projects? An empirical study on open-source projects* [THG20], which was published in the Journal of Systems and Software in 2020.

**Keywords:** Software testing; Unit testing; Integration testing; Empirical software engineering

## 1 Overview

The article “Are unit and integration test definitions still valid for modern Java projects? An empirical study on open-source projects” published in the Journal of Systems and Software in 2020 presents the results of our investigations of the defect detection capability of unit and integration tests [THG20]. While the software development context evolved over time, the definitions of unit and integration tests remained unchanged. There is no empirical evidence, if these commonly used definitions still fit to modern software development. We evaluate if the existing standard definitions of unit and integration tests are still valid in modern software development context through the analysis of the defect types that are detected, because there should be differences according to the standard literature. We classify test cases according to the definition of the IEEE and use mutation testing to assess their defect detection capabilities.

## 2 Results

We analyzed 9356 unit tests and 29461 integration tests and could not find any evidence that one test type is more capable of detecting certain defect types than the other one. This implies that we need to reconsider the definitions of unit and integration tests and suggest that the current property-based definitions may be exchanged with usage-based definitions.

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## **Bibliography**

- [THG20] Trautsch, Fabian; Herbold, Steffen; Grabowski, Jens: Are unit and integration test definitions still valid for modern Java projects? An empirical study on open-source projects. *Journal of Systems and Software*, 159:110421, 2020.