

Our work satisfies the “Journal First” manuscript type, because this work is the first one to combine one-test-one-time covering array generation approach with failure-inducing interaction identification method in an interleaving way. When compared with the traditional approach, i.e., firstly generate a complete covering array and then identify the failure-inducing interaction, our framework can reduce many unnecessary test cases and improve the accurateness of identifying the failure-inducing interactions.

Additionally, we augmented the MFS identification part, i.e., OFOT, with a novelty feedback checking mechanism, such that it can handle the multiple MFS problem more effectively. What’s more, our new MFS identification approach can also alleviate the negative influence of the safe value assumption, which is a common assumption proposed in failure-inducing interaction identification approaches. As a consequence, our approach significantly improves the scores of many metrics (for example, the accuracy of MFS identification, the tested-t-way-coverage) when compared with other approaches.

At last, our approach does not extend any prior work with solely with additional proofs or algorithms or other such details presented for completeness, or additional empirical results, or minor enhancements or variants of the results presented in the prior work.