

## User-Awareness from Eye Line Tracing During Specification Writing to Improve Specification Quality

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**Abstract :** Many defects after the release of software packages are caused due to omissions of sufficient test items in test specifications. Poor test specifications are detected by manual review, which imposes a high human load. The prevention of omissions depends on the end-user awareness of test specification writers. If test specifications were written while envisioning the behavior of end-users, the number of omissions in test items would be greatly reduced. The paper pays attention to the point that writers who can achieve it differ from those who cannot in not only the description richness but also their gaze information. It proposes a method to estimate the degree of user-awareness of writers through the analysis of their gaze information when writing test specifications. We conduct an experiment to obtain the gaze information of a writer of the test specifications. Test specifications are automatically classified using gaze information. In this method, a Random Forest model is constructed for the classification. The classification is highly accurate. By looking at the explanatory variables which turn out to be important variables, we know behavioral features to distinguish test specifications of high quality from others. It is confirmed they are pupil diameter size and the number and the duration of blinks. The paper also investigates test specifications automatically classified with gaze information to discuss features in their writing ways in each quality level. The proposed method enables us to automatically classify test specifications. It also prevents test item omissions, because it reveals writing features that test specifications of high quality should satisfy.

**Keywords :** blink, eye tracking, gaze information, pupil diameter, quality improvement, specification document, user-awareness

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