

Factors affecting performance of target acquisition tasks for touchpads

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=9999920535803&lokasi=lokal>

Abstrak

This study investigates the effect of touchpad size, position filter, and control display gain on user performance. Observations include the behavior of user while using the touchpad to acquire color-changing targets. This study examines the effect of two touchpad sizes, which consist of large (100×60 mm) and small (65×36 mm) sizes, position filters (30, 50), and control-display gains (0.5, 1, 2) on acquiring targets that appeared in eight positions (0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°), at three distances (100, 300, 500 pixel) and 3 different levels of target size (10, 40, 70 pixel). As for the results, touchpad size significantly affects movement time, error count, movement count, and re-entry count. Position filter also significantly affects the re-entry count. The different behavior of touchpad user differs significantly regarding to performance measurements. Filter 50 and Gain 2 for primary movement and Filter 30 and Gain 0.5 for secondary movement are the best combinations for participants to achieve optimum performance. Based on Fitts' Law, the proposed model successfully predicts movement time by adding the effect of CD gain in formulating the task's difficulty index ($R^2 = 0.8147$). The results in this study will be useful for microelectronic companies to increase touchpad performance and to offer suggestions for designing touchpads based on optimal settings. Furthermore, this study also reveals that each type of touchpad features different settings to achieve optimum performance.