When Stick-slip Hinders Human Positioning Performance

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Abstract: This study investigated the effect of the difference between static and Coulomb friction on human performance in a positioning task. A custom designed 1-dof interface was used, for which the amount of static and Coulomb friction was varied. It was found that an increasing difference between static and Coulomb friction negatively affected performance. The amount of impact on the positioning performance depended on the positional resolution required: smaller movements increase the negative effect. Eventually, thresholds for the difference between static and Coulomb friction are presented that can be used as guidelines for input devices that are similar to the one used in this experiment.

Keywords: Coulomb friction, Static friction, Stick-slip effect, input device, human performance.