

TouchScope: A Hybrid Multitouch Oscilloscope Interface

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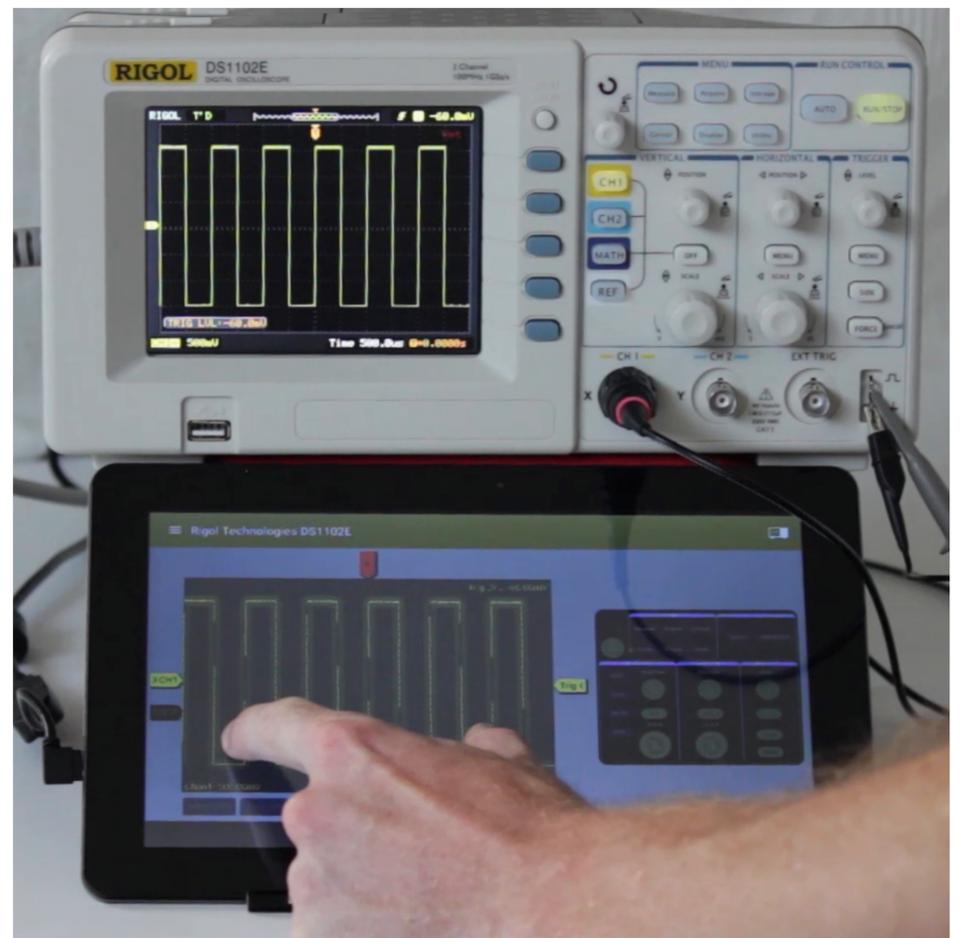
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Summary

Oscilloscopes are valuable tools for analyzing electronic circuits, but also complex scientific instruments. Novices are faced with a seemingly overwhelming array of knobs and buttons, and usually require lengthy training before being able to use these devices productively.

TouchScope uses a multitouch tablet together with an off-the-shelf oscilloscope to provide a novice-friendly hybrid interface, merging the low entry barrier of a touch-based interface and the high degrees of freedom of a conventional button-based interface.

Our evaluation with 29 inexperienced participants shows a comparable performance to traditional learning materials as well as a significantly higher level of perceived usability.



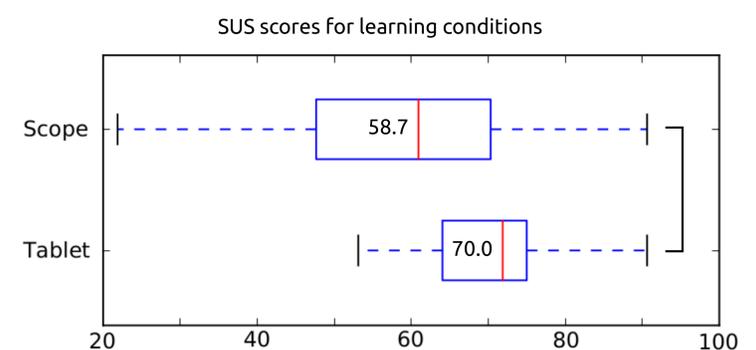
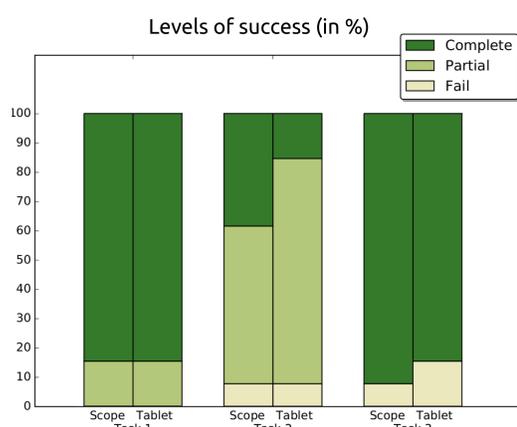
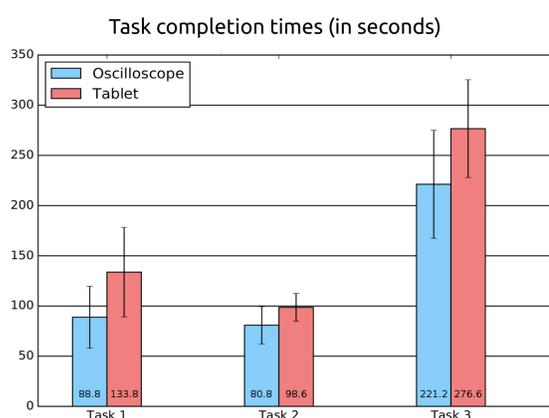
Tablet device running TouchScope app (bottom), synchronized with Rigol oscilloscope (top)

Performance Evaluation and Discussion

Our evaluation focused on using TouchScope as a learning tool, and consisted of two phases: a training phase which was completed either on the tablet or directly on the oscilloscope, and a test phase with 3 tasks of increasing difficulty which was always completed on the oscilloscope.

Quantitative test results (task completion time, levels of success, assistance count) do not show any significant differences between those participants who learned on the tablet, and those who learned on the oscilloscope. Consequently, we conclude that the learning performance of TouchScope is at least on par with traditional learning materials.

However, the subjective SUS score for TouchScope is significantly higher (by over 10 points) than for the scope itself. This is an encouraging result, as it suggests that the more familiar touch-based interface will present a lower entry barrier to novices than the oscilloscope itself.



Fork me on GitHub: <https://github.com/mmbuw/touchscope> ==>

