An Evaluation of Mobile Phone Pointing in Spatial Augmented Reality

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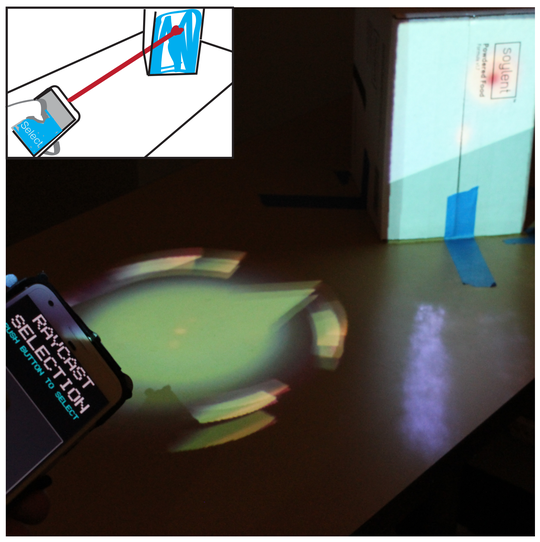
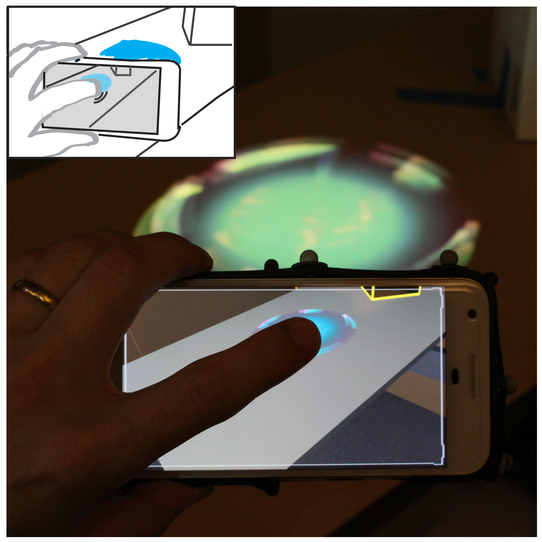
We evaluate three mobile phone pointing techniques for digital content placed directly onto objects in a real physical environment. Our results show raycast is fastest for high and distant targets, tangible is fastest for targets in close proximity, and viewport performance is in between.

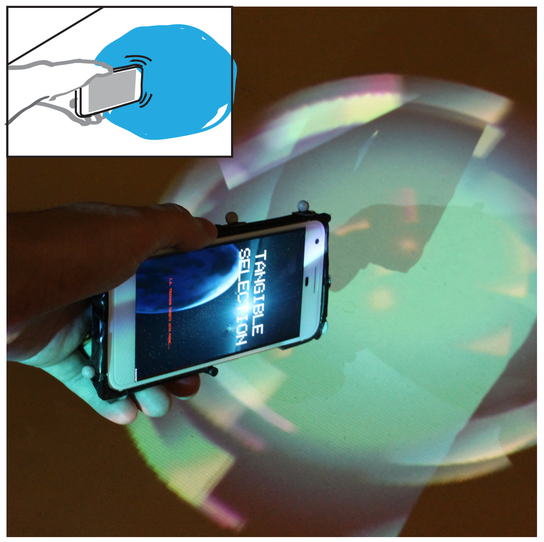
Techniques



Raycast: point phone towards target and tap to select.



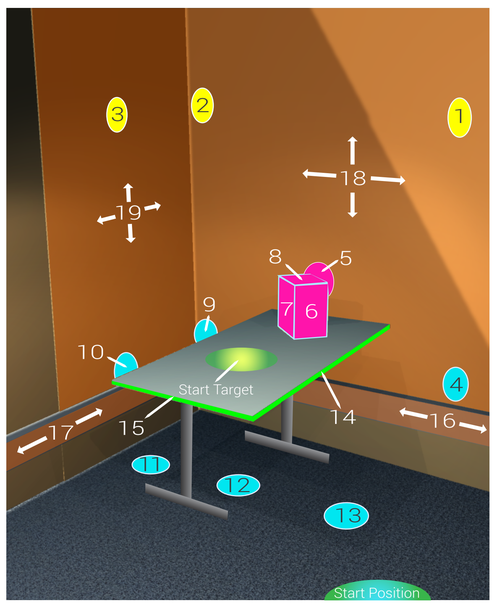
Viewport: move phone to frame target and tap to select.



Tangible: use phone to tap directly on target.

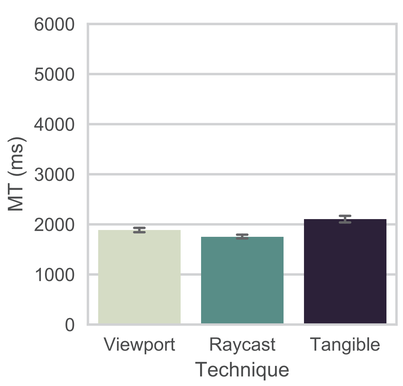
Experiment

Participants selected two targets in sequence, first a a start target and then another target located at 19 different locations **covering 5 types (high, mid, low, table, and large).**



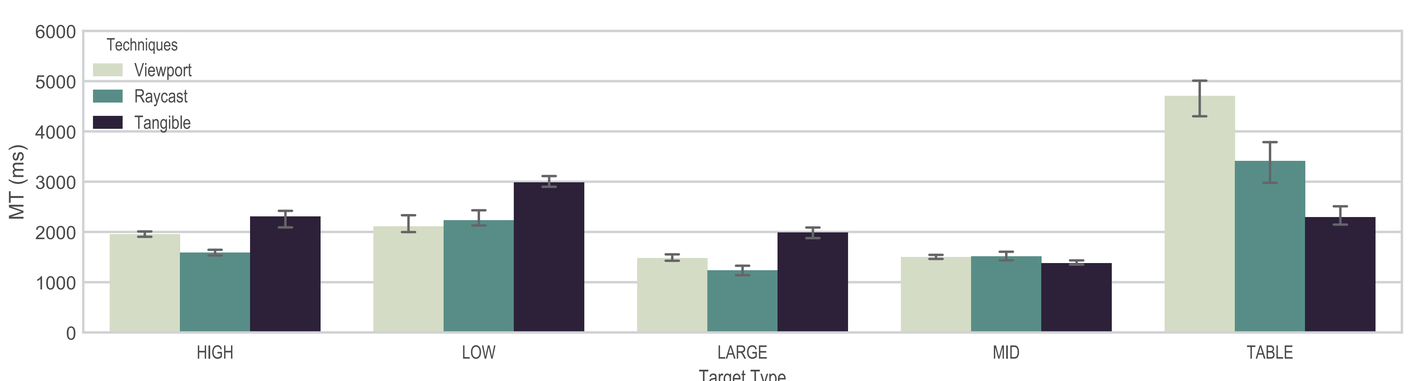
Results

Overall



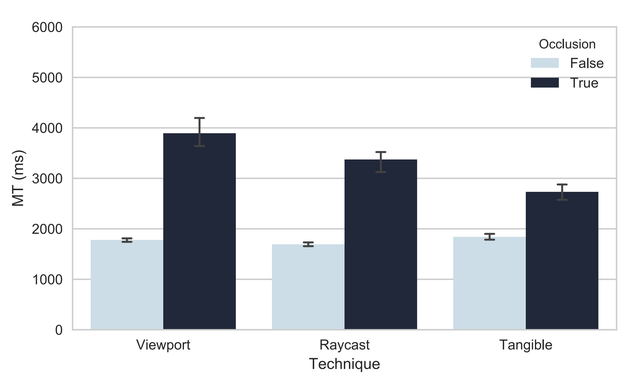
Overall raycast is faster than tangible and viewport.

By Target Type



Raycast is fastest for high and large targets, but both raycast and viewport are tied for low targets; tangible has the fastest time for both mid and table targets.

Occluded Targets



Viewport was affected the most by initial target occlusion.