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| **Visual search through a 3D volume: Studying novices in order to help radiologists** |
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| Modern radiology often involves search for abnormalities in 3D volumes of imagery (e.g. chest CT, breast tomosynthesis). Drew et al., (2013) used eye tracking to identify two different search strategies: “drillers” scroll quickly through depth while keeping their eye position relatively constant, while “scanners” examine each XY plane before scrolling more slowly in depth. To determine if one method is inherently superior, we developed an analog to radiologic search that can be performed by non-experts. Target “T's” and distractor “L's” were inserted into a 3D block of 1/f noise. Naive participants were given driller or scanner instructions. Observers marked T's they found with mouse clicks. XY eye-position was recorded at 1000 Hz and co-registered with slice/depth plane as the observers scrolled through the 3D volume. Scan paths indicate that observers were scanning or drilling as instructed. Results from 8 participants reading 21 simulated cases suggest that miss error rates were lower for drillers than for scanners. Search durations, however, were ~2X longer for drillers (186sec vs 98sec). This raises the obvious possibility of a speed-accuracy tradeoff that might be countered by further instruction. Drilling, overall, was associated with somewhat shorter fixations (270 msec vs 229 msec) and shorter distances travelled per unit of time by the eyes, consistent with the differences between drilling and scanning. More extensive testing of non-radiologists is required before recommendations could be made regarding best practice by experts. |