

Abstract Submitted
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Retrieving masked signal through tracking and wavefront shaping KAITLIN JENNINGS, NAZIFA RUMMAN, TIANHONG WANG, PASCAL BASSENE, FINN BULDT, MOUSSA N'GOM, Rensselaer Polytechnic Institute — We present a novel wavefront shaping approach that allows for the tracking and localization of hidden objects within or behind a scattering medium. The method combines traditional feedback based wavefront shaping with a switch function using two different signals. Using two detectors, one monitors the speckle signature from the scattering sample while the other tracks the fully hidden signal (e.g. fluorescent beads). The algorithm is established to optimize the incident field to maximize light transmission into a random point. The dynamic optimization of the field will induce instantaneous changes in both signals being monitored. The modulation process redirects the input signal, which in turn allows the location of the hidden objects. With the increase in the targets' distinction the algorithm switches to use this signal as the feedback. We provide experimental demonstrations as a proof of concept of our approach. Potential applications of our method include extracting information from biological samples and developing noninvasive diagnosis methods.

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