

# Shadow Elimination and Occluder Light Suppression for Switched Multi-Projector Displays

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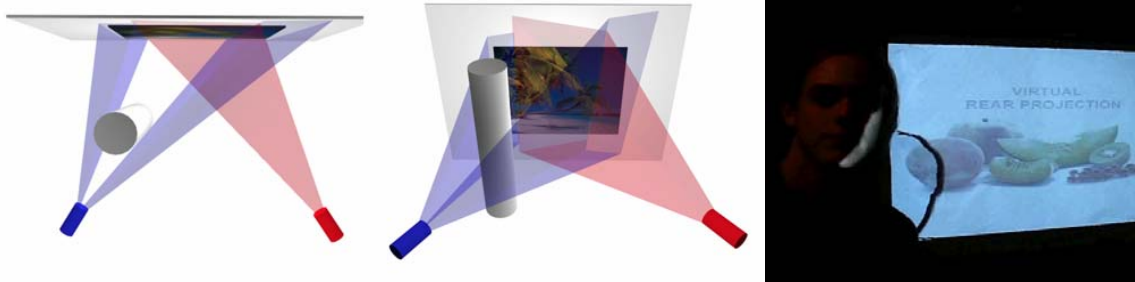
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Two related problems of front projection displays which occur when users obscure a projector are: (i) undesirable shadows cast on the display by the users, and (ii) projected light falling on and distracting the users. Our system uses multiple, conventional projectors which are positioned so that their projections overlap on the selected display surface to produce shadow-free displays even in the presence of multiple, moving occluders. Furthermore, projector light cast on the occluders is suppressed without affecting the quality of the display.

This demonstration is a two projector binary switching system where each pixel on the screen is illuminated by only one projector at any one time. If there is any observed deviation in pixel value from the reference pixel value, captured during initial calibration, it may be deduced that the illuminating projector is occluded without active probing. The system immediately blanks the pixel contribution from the current illuminating projector, and turns on the contribution to the other projector. This results in a binary switching process that is extremely fast. Our current demonstration eliminates shadows and suppresses occluder light at about 8 Hz.



<p><b>Top view of multi-projector system:</b> When a cylinder is placed in the projected light path of the blue projector, the system switches occluded pixels to the red projector.</p>	<p><b>Front view of multi-projector system:</b> The keystone-corrected display on the screen does not suffer from shadows cast by the occluding cylinder.</p>	<p><b>Snapshot of binary switching demo:</b> As the user head moves from left to right, occluded pixels are switched. The unprocessed shadow and occluder light is visible due to feedback lag.</p>
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