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Constructing a 3D Printable Microscope with Video Projector Illumination NEHA SUNIL, LEQI LI, JOSH UY, EDWARD CARLO SAMSON, Miami University — Using physical filters in traditional microscopes to produce different types of contrast-enhanced imaging is both costly and time-consuming. We investigated the results of imaging data taken from our constructed 3D printable lens system utilizing structured illumination from a quick and affordable source, a video projector. Our group set up a Raspberry Pi camera as well as condenser and objective lenses to capture a specimens images illuminated by dark background and grey annulus to result in dark field illumination. Taking pictures of a 1951 USAF Resolution chart we analyzed the imaging resolution of our system. The modulation transfer function and point spread function of our image contrast data showed an imaging resolution of approximately 10 microns. We will discuss the design of our 3D printable microscope and the effects the geometry of the projected pattern has on the images of our acquired specimen.

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