A system for measuring the illumination uniformity of a liquid crystal light valve (LCLV) for a LCLV projector includes a projection device including a first LCLV. The projection device reflects light from the first LCLV to form an image on a screen. An image sensing device senses illumination values for a plurality portion of said image. A processor is coupled to the image sensing device and the projection device. The processor determines an optimum voltage bias which provides a maximum illumination for the plurality of image pixels. The illumination uniformity measuring system can independently measure the illumination non-uniformity of the LCLV and illumination non-uniformity resulting from other sources such as projection lens roll-off, screen gain, and other illumination non-uniformities. Using the measured illumination non-uniformity, a correction system can improve the quality of the displayed image.