

# Colour Correction for Projection-Based Augmented Reality

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Projection-based Augmented Reality (AR) is a type of AR implementation. Instead of using wearable devices, it uses the projector to display the virtual object in the real world. It is the best solution for some specific scenarios like showing AR to a group of people. When using projection-based AR in real life, the environment illumination is not controllable, and the projected background is not always white. Therefore, it is necessary to find some way to make the darker part clear and correct the colour from the colour deviation on a non-white background. This dissertation provides a reasonable solution to analyse the darker part and correct the colour. For the darker part, we lighten its surrounding areas to make it clear. For the colour correction, we involved the colour transfer method to modify the display image based on the background. We tested several different background analyses and colour transfer ways, and find the best solution for different backgrounds and display images. Then create a map to record the best solution for different occasions. our colour correction solution is based on this map. We first recognize the background colour and the style of the display image, and then use the map to find the best algorithm. Use this algorithm to manage the display image, and the result is the solution we will give. This solution can works better on a solid non-white background, but still can reduce the colour deviation on texture background.