

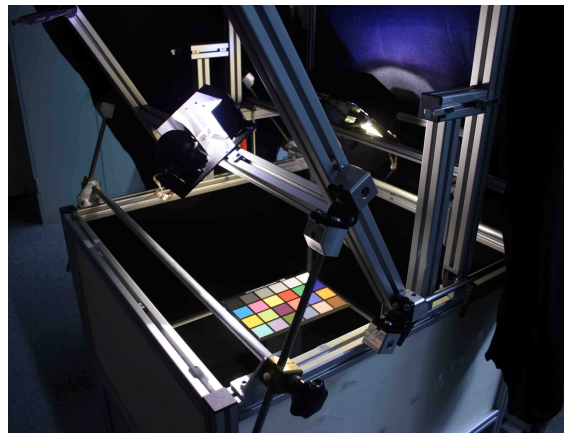
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"From an impartial point of view " Imaging stand at of RWTH University in Aachen

The preconditions for the optimum processing of a wide range of tasks in the field of image processing are flexibility and simplicity of evaluation. The imaging stand created using the item Building Kit System and installed in the Institute of Imaging and Computer Vision enables the required configurations, for example for tasks involving industrial quality controls, to be quickly and easily set up.

This test stand comprises a complete imaging system - from the lighting, using several halogen spotlights, through to camera supports made of profiles from item's Line 8, Profile

40x40 light. One example of the extremely flexible construction is the height adjustment system for the camera, which is effected rapidly and simply by pressing together two levers. The lighting system consists of several halogen lamps which, thanks to the flexible item concept, can be freely positioned within a two-dimensional plane and just as easily locked in place. The halogen lamps which, in contrast to the neon lights usually used in industrial imaging have far improved colour reproduction, are also arranged in such a way that they illuminate the subject as uniformly as possible. Perfect imaging results are achieved by the use of diffuser material and post-correction of the brightness gradients using suitable software. The cameras used are either a 1.3 megapixel 1-chip industrial camera with a C-mount lens or a multispectral camera which is capable of creating images with far greater colour accuracy than standard RGB cameras. The IEEE 1394 (FireWire) connections on the cameras also enable rapid transfer of the images to a PC and, at the same time, allow the camera settings to be easily controlled.



The multispectral camera records a total of seven spectral channels individually at the highest possible resolution, which prevents the image details being corrupted through interpolation, as with 1-chip RGB cameras (such as typical consumer cameras). The multispectral camera is also capable of generating realistic simulations of numerous different forms of light sources (daylight, halogen light), can register metameric colours (i.e. colours which appear identical but have physically different spectral compositions) and realistic colour images, i.e. those that are adapted to the human eye.

To determine the camera transfer function, i.e. the relationship between the intensity of the light and the sensor response of the camera, the Institute of Imaging and Computer Vision is to develop a suitable set-up. This set-up will consist of a movable camera mounted on a rail opposite a fixed, homogeneous, constant light source. The intensity of the light source is calculated in relation to the distance between the camera and the lighting. Once a series of images has been photographed at different distances, the camera transfer function (CTF) can be determined. A rigid but versatile support structure for the measuring system is essential to ensure the accuracy of the measurements, which is why the system is built from components in the item Building Kit System.

