

Master 2021

Ms. Divya Vishwanath

Development of a Calibration Procedure for a Spectrophotometer for the Metrological, Point-by-Point Recording of the Colour Spectrum on 35mm Film Reels.

ABSTRACT - Masterthesis

Calibration of a device is essential as it defines the accuracy and quality of measurements recorded by the device.

The aim of the Master Thesis is to develop a calibration procedure for a colorimetric analysis device which is used to measure historical transmissive images on photo-chemical 35mm film reels. A spectrophotometer (IBSEN FREEDOM VIS) along with an optical front-end and a broadband illumination source is used for the measurement. Spectrophotometer is based on Hamamatsu S11639-01 sensor with a wavelength range 360 to 830nm and resolution of 1.3nm spectral components. A micro light spot of about 200/-Lm is focused to the image which reads out the film colour on a highly selective image area.

The set-up of the measurement procedure involves: a light source and optical illumination front end. The light from the source passes through the transmissive film and is focussed on to the optical camera front end which is connected to a spectrometer through a fibre optic cable. The spectrometer consists of mechanical slit, diffraction optics, image sensor. Spectrophotometer is in turn connected via USB interface to a PC for spectral lines, intensities and wavelength analysis.