

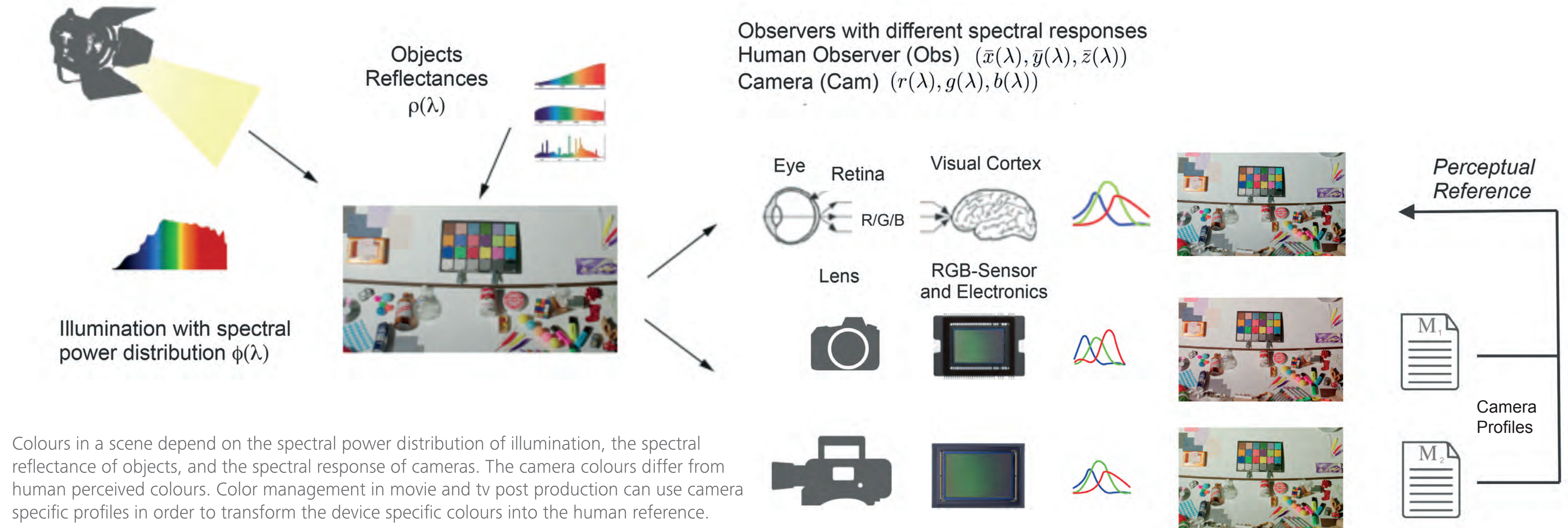
# Open Film Tools

## Camera Colour Management Tools for Movie and TV Production

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Open Film Tools is a toolset to create camera colour profiles based on the recommended procedure for creating Input Device Transforms (ACES-IDT) defined by the Academy of Motion Picture Arts and Sciences.

### The Scene - from Spectra to Colours



## Open Film Tools Components for a Spectral Data Based Colour Management

### A Spectral Database of Cine Lighting

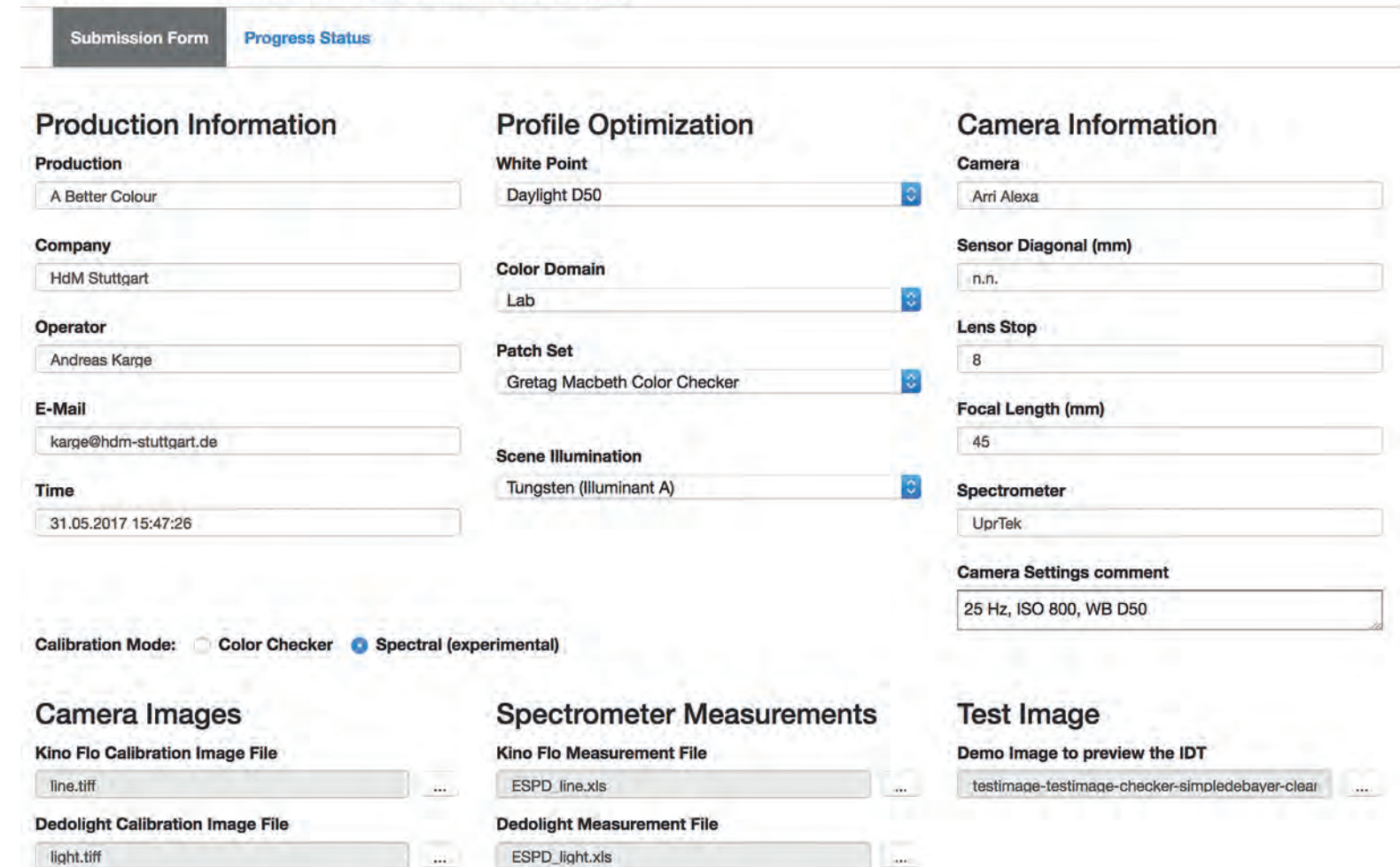
Based on an ISO specified measurement setup, a spectral database of commonly used cine lighting were created. It includes several Tungsten, HMI, Fluorescence and LED lights.

### A Web based IDT Creation Profile Server

### Hardware for Measuring Camera Spectral Resonse

A low-cost hardware was developed, allowing quick measurement of spectral responses of cameras. It includes a 3D-printable case design, a list of the optical elements to be assembled, and a standardized measurement method.

#### Open Film Tools IDT Profile Creation



Submission Form Progress Status

**Production Information**  
Production: A Better Colour  
Company: HDM Stuttgart  
Operator: Andreas Karge  
E-Mail: karge@hdm-stuttgart.de  
Time: 31.05.2017 15:47:26

**Profile Optimization**  
White Point: Daylight D50  
Color Domain: Lab  
Patch Set: Gretag Macbeth Color Checker  
Scene Illumination: Tungsten (Illuminant A)

**Camera Information**  
Camera: Arri Alexa  
Sensor Diagonal (mm): n.h.  
Lens Stop: 8  
Focal Length (mm): 45  
Spectrometer: Up!Tak  
Camera Settings comment: 25 Hz, ISO 800, WB D50

Calibration Mode:  Color Checker  Spectral (experimental)

**Camera Images**  
Kino Flo Calibration Image File: kino.tif  
Dedolight Calibration Image File: light.tif

**Spectrometer Measurements**  
Kino Flo Measurement File: ESPD\_kino.xls  
Dedolight Measurement File: ESPD\_light.xls

**Test Image**  
Demo Image to preview the IDT: testimage-testimage-checker-simpledebeaver-clear

A web based camera profile server was implemented. The spectral characteristics of lighting, objects and camera are used for creating ACES-IDT colour profiles.

## Benefits of Open Film Tools

### Increase Cost Efficiency in Postproduction

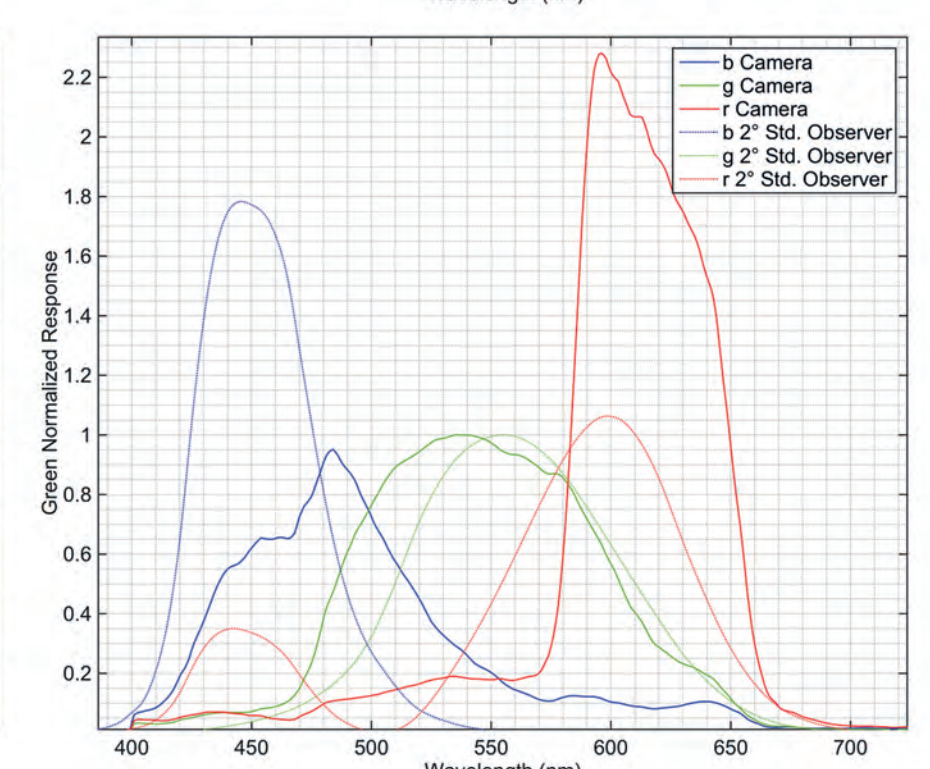
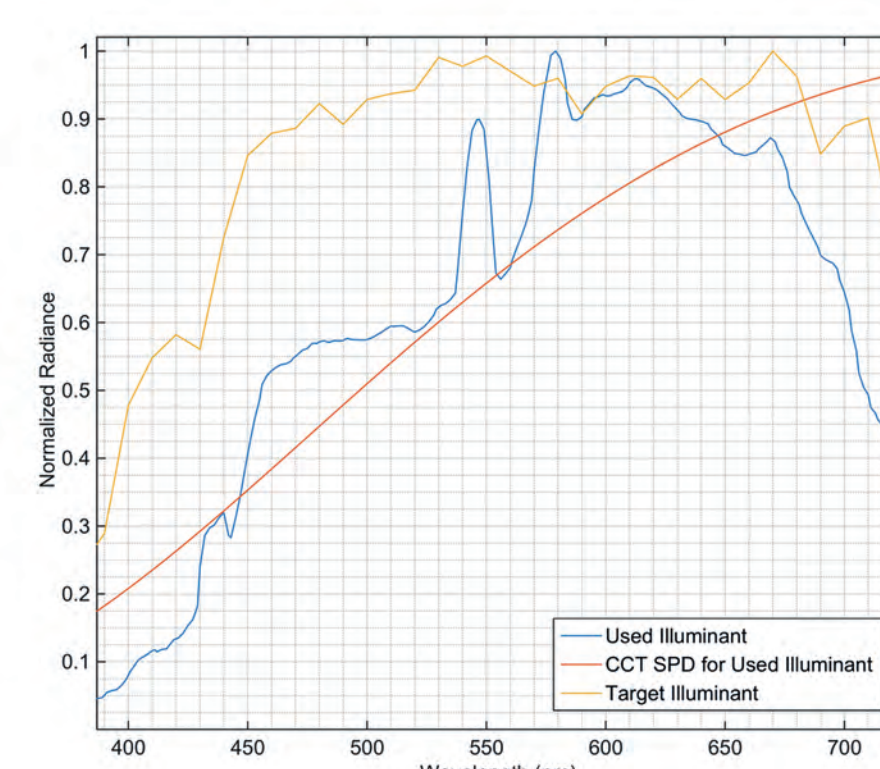
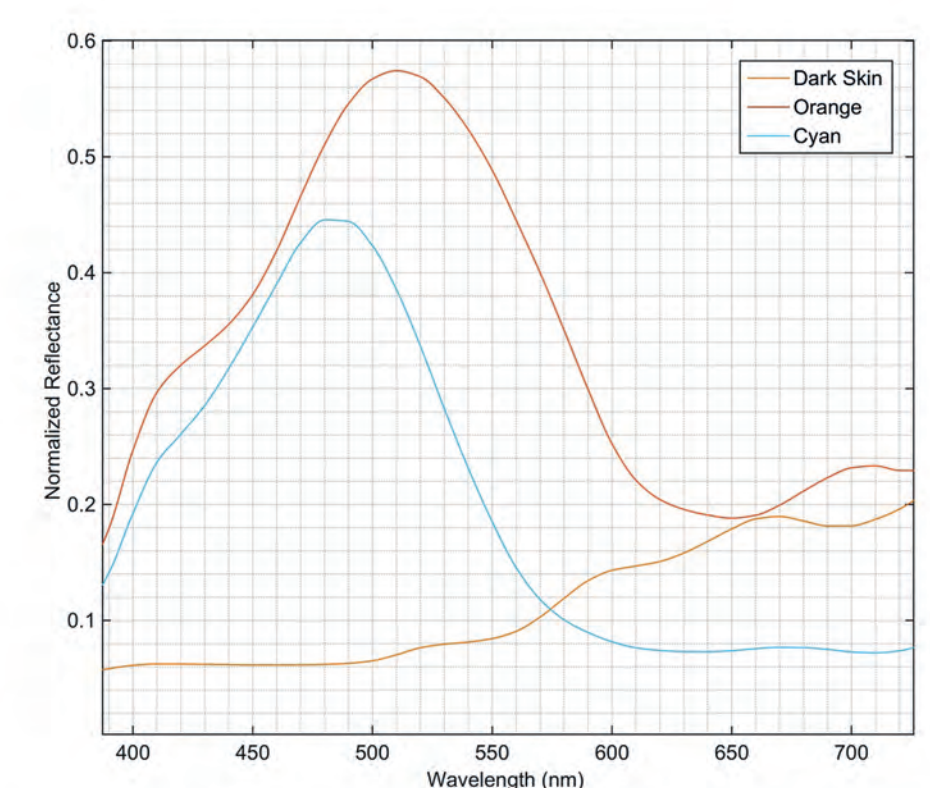
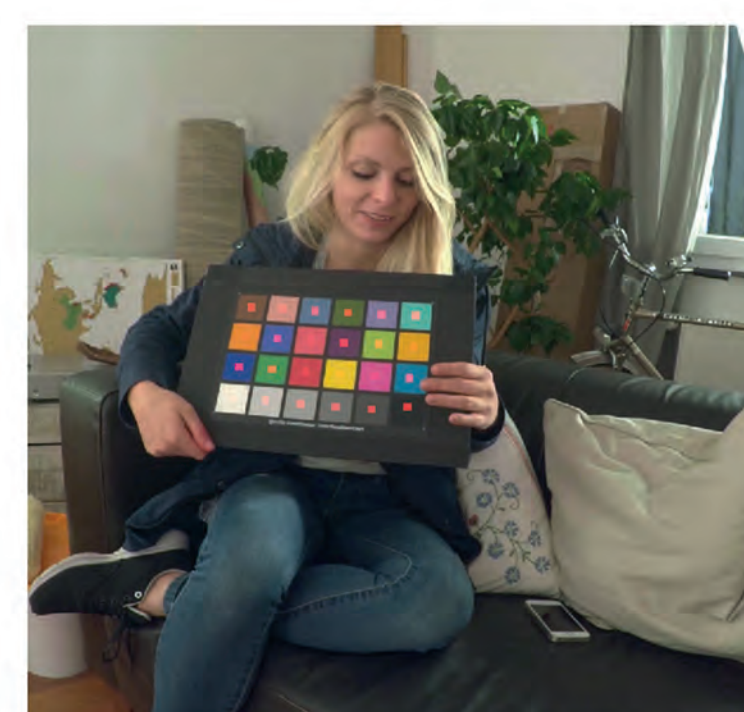
All Open Film Tools components are freeware. They can be used together within an ACES based colour management workflow for example in combination with OpenColorIO in postproduction tools. It reduces the time for device specific colour characterization and correction. The manual colour correction can now be done automatically. For huge productions using various cameras, colour constancy can be guaranteed especially for combined image sequences.

### Characterization of Cameras with Awareness of Lenses, Mixed Scene Illumination and Objects

Open Film Tools allow the creation of profiles, even for cameras with unknown spectral response or if the manufacturer does not provide a profile. The colour characteristics of the lens and the real scene illumination is also taken into consideration for profile creation, whereas manufacturers only provide lens independent profiles for standard illuminants. Furthermore Open Film Tools profile creation allows the input of custom object spectra, especially for highly saturated objects this can increase the colour quality.

For example, figures right show a scene sample for a GoPro camera. The camera response were measured with Open Film Tools, as well as the created profile were computed by Open Film Tools profile server. The mixed scene illumination using several LED and HMI lights was used for profile creation. This leads to better colours (see table below with some samples).

	$L_{CCT}$	$a_{CCT}$	$b_{CCT}$	$L_{spec}$	$a_{spec}$	$b_{spec}$	$\Delta E_{2000,CCT}$	$\Delta(\Delta E_{2000})_{spec,CCT}$
Dark Skin	44.65	10.74	24.44	44.58	11.31	23.49	9.21	-0.70
Orange	67.88	30.75	68.00	67.72	32.27	63.25	6.76	-1.77
Cyan	48.50	-16.68	-23.55	48.69	-17.94	-22.41	6.18	-0.60



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