



## Ressources BPMNP

**This page contains a database of hyperspectral images.**

Most existing hyperspectral database are mainly outdoor scenes with limited field-of-view (FOV), or pictures of specific objects. Our will is to make available, to the lighting and color community, a database of high spatial and spectral resolution images with large FOV.

Natural and man-made built environments available in the database were acquired using a VNIR4 SPECIM (sCMOS-50-V10E model) hyperspectral camera attached to a SPECIM rotating scanner. A 18.5mm lens (f/2.4 fixed aperture) was mounted on the camera which is equipped with a sCMOS sensor (14.2mm width, x-y spatial resolution is 2160\*1080 pixels).

The resulting vertical FOV is 42° (the horizontal FOV depends on the rotation of the camera). The camera spectral range is 400-1000nm. Its spectral resolution FWHM is 2.9nm (30microm slit). Spectral sampling varies between 0.63 and 5.07nm

according to the binning. The signal-to-noise ratio (peak) is 170:1 (no binning).

For reducing file size, data were acquired with a 2-by-2 binning resulting in a vertical spatial resolution of 1080 pixels and 480 spectral bands with a width between 1.22nm (at 394.6nm) and 1.34nm (at 1007.00nm). Dark noise correction and radiometric calibration were done in AizaTools Version 4.3 vs2008 producing two ENVI files: a binary file (.dat), and a header file (.hdr) containing the metadata associated with the binary file. The Matlab multibandread command can then be used to load ENVI files and produce hyperspectral cubes (radiances are in  $\mu\text{W}/\text{cm}^2\cdot\text{sr}$  per nm).



## /// Hyperspectral Database

### >> Lab scenes



LIGHTBOOTH\_001

LED lighting @2700K, 3000K, 4000K, 5000K, 6500K

Original capture: 3214-by-1080 pixels



LIGHTBOOTH\_002

LED lighting @5400K, incandescent lighting @5050K and 2550K

Original capture: 2078-by-1080 pixels

### >> Urban scenes



URBAN\_001

Original capture: 1948-by-1080 pixels



URBAN\_002

Original capture: 1652-by-1080 pixels



URBAN\_003

Original capture: 2152-by-1080 pixels



URBAN\_004

Original capture: 3177-by-1080 pixels

>> **Outdoor**



OUTDOOR\_001

Original capture: 3162-by-1080 pixels



OUTDOOR\_002

Original capture: 3636-by-1080 pixels



OUTDOOR\_003

Original capture: 3377-by-1080 pixels



OUTDOOR\_004

Original capture: 3074-by-1080 pixels



OUTDOOR\_005

Original capture: 2729-by-1080 pixels

## >> Flowers



FLOWERS\_001

Original capture: 2598-by-1080 pixels

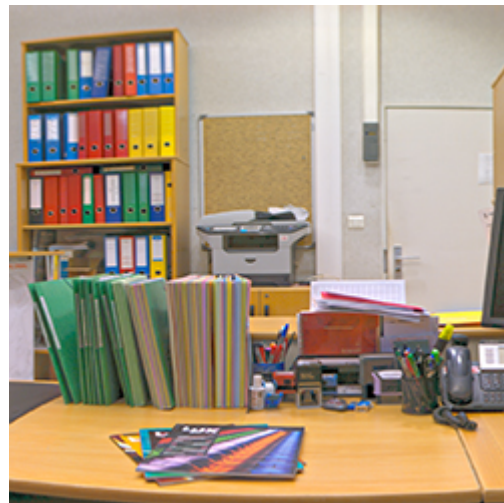
## >> Indoor scenes



INDOOR\_001

Mixed lighting (fluo+daylight)

Original capture: 1256-by-1080 pixels



INDOOR\_002

Mixed lighting (fluo+daylight), artificial lighting (fluo)

Original capture: 2572-by-1080 pixels

## ***CONTACT***

For more information, contact Sophie Jost ([sophie.jost@entpe.fr](mailto:sophie.jost@entpe.fr)).

To access the database, send an email to Sophie Jost ([sophie.jost@entpe.fr](mailto:sophie.jost@entpe.fr)) in specifying the image(s) and if applicable the light source(s) you want to download.

If you use images from our database, please cite this publication: Cauwerts C. & Jost S. (2019). Color rendering of window glass: analysis of landscape content with hyperspectral imaging. Proceedings of the International Colour Association (AIC) Conference 2019, Buenos Aires, Argentina, October 14-17.