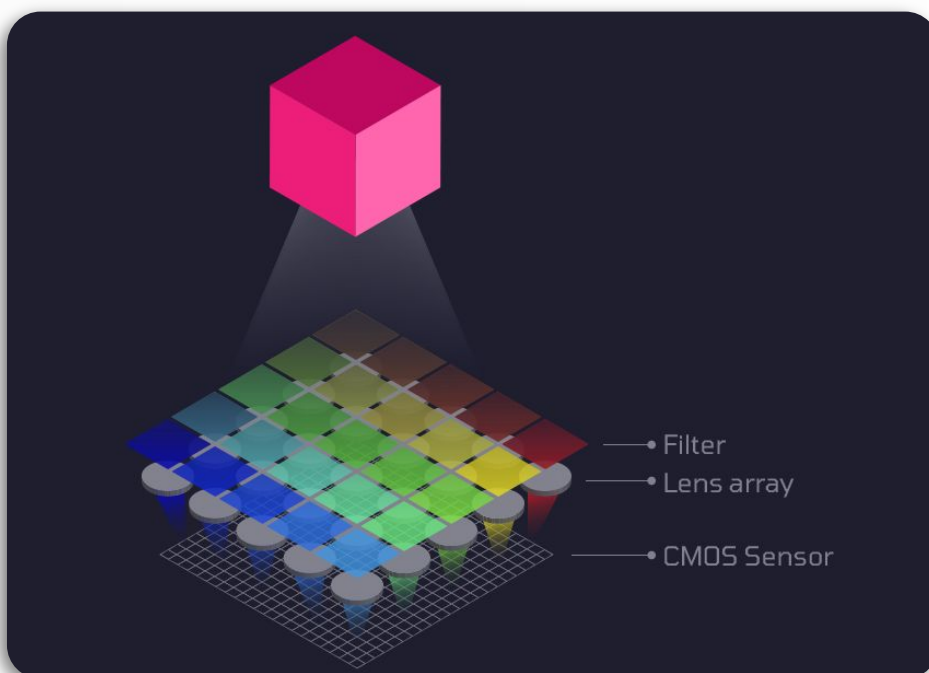


Designing a Hyperspectral Video Camera

Why Light Field Spectral Imaging is a great Idea

Customers know best what an **ideal hyperspectral camera** for their application should look like. Our highly adaptable approach using **light field technology** allows for fully customized solutions, built at a reasonable price with short lead times. With a mix of off-the-shelf components when available and special build parts where needed, almost any combination of **imaging sensor**, **micro lens array** (MLA) and **filter set** can be achieved. This gives us a maximum amount of flexibility to play with these features.



Working Principle

The camera array captures a scene from different angles. Every single image taken through one of the lenses of the MLA records a slightly different wavelength of the scene while preserving all other positive aspects of the light field. Thus, the wavelength and radiant intensity, as well as the position and direction of the light, is captured.

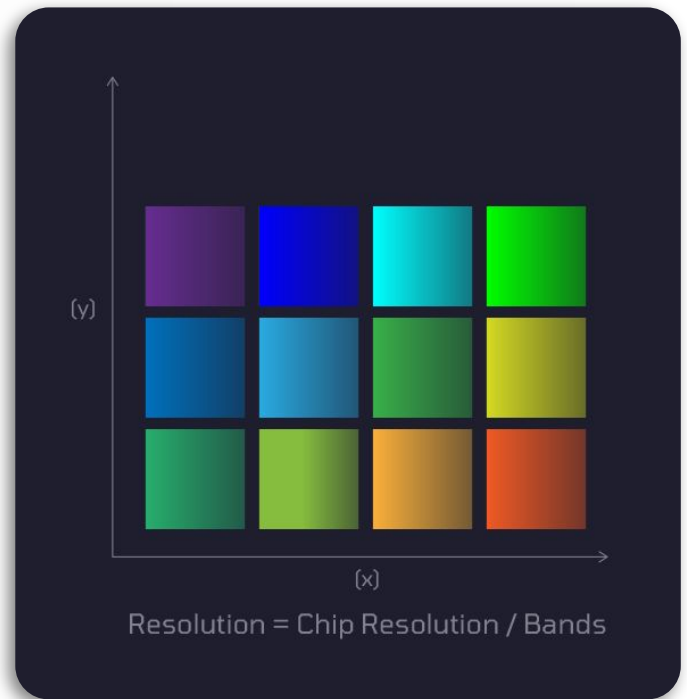
Build your own System!

Hyperspectral light field cameras are highly adaptable, as the resolution of each band is a function of the sensor's resolution and the number of desired bands. Let's take a closer look to the components that can be modified in your customized system:

Filter - The use of linear variable or discrete filter sets in combination with a corresponding sensor allow the flexible selection of wavelength ranges, number of channels and spectral sampling.

Microlens Array - The MLA generates a multiple of similar images onto the sensor (like an insect's eye). We design the MLA to perfectly fit your requirements in the final resolution of the camera .

Sensor - The rapid development in the field of sensor technology has greatly increased the affordability of high resolution, high-speed imaging sensors. For hyperspectral light field cameras, this higher resolution can either be used for better spectral sampling (more channels) or higher spatial resolution.



Customizable Camera Specifications

Wavelength range	UV, VIS, NIR, SWIR
Spatial resolution	Function of approx. $(\text{Sensor size X} * \text{Sensor size Y}) / \text{Number of bands}$
Number spectral bands	$(\text{Sensor size X} / \text{Image size X}) * (\text{Sensor size Y} / \text{Image size Y})$
Frame rate [Hz/fps]	Depends on sensor and connectivity
Field of View (FOV)	Depends on MLA (which can be designed to spec) or used with relay optics
Connectivity	GigE, USB 3.0, 10 GigE, CameraLink*, CoaXpress*
Data Depths	8-14 Bit / Depending on Sensor
Relay Optics	Individually designed to fit any industrial standard optics (C-mount)

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Need more information?

Please contact us! We'd be delighted to answer any of your questions you may have.

