

The frontiers of hyperspectral imaging

State of the art of Hyperspectral Cameras

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Spectral imaging, also known as imaging spectroscopy, refers to methods and devices for acquiring a complete light spectrum for each point in the image of a scene. It provides much richer information with respect to standard imaging, enabling to identify materials or detect dynamical processes. Spectral imaging has been applied to a wide range of scientific investigations, such as remote sensing, pigment determination in biology, medicine, coastal ocean imaging, water analysis, agriculture, cultural heritage and archaeology, just to cite a few. In particular, hyperspectral imaging aims at acquiring the whole continuous spectrum of each point of the scene. A powerful approach to this aim is to combine classical imaging with Fourier-transform spectrometry [1].

In this talk, I will describe the main properties of the spectral imaging and the current acquisition approaches. I will also show the most recent advancements obtained at the Istituto di Fotonica e Nanotecnologie (IFN-CNR), based on an innovative optical device [2]. Our compact hyperspectral system is able to acquire spectral reflectance and fluorescence images with high sensitivity, broad spectral coverage and high spectral resolution. Examples of hyperspectral images for remote sensing and cultural heritage will be provided and discussed [3].

References

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