A

B

Blind Compressive Sensing (BCS) In compressive sensing (CS) the signal which is sparse in some basis representation can be recovered from a small number of linear measurements. However, prior knowledge of the sparsity basis is essential for the recovery process. In BCS, we do NOT need to know the sparsity basis in both the sampling and the recovery process. Given certain constraints are satisfied as long as the signals are sparse enough one can achieve results similar to that of standard compressive sensing.

C

CASSI (Coded Aperture Snapshot Spectral Imaging) The CASSI is a compressive sensing spectral imager. (Some computational hyperspectral imagers are NOT compressive). The CASSI utilizes a coded aperture and one or more dispersive elements to modulate the optical field from a scene. The nature of the multiplexing performed depends on the relative position of the coded aperture and the dispersive element(s) within the instrument. There are two types of CASSI: The dual disperser (DD) CASSI. The single disperser (SD) CASSI

DD CASSI (Dual Disperser Coded Aperture Snapshot Spectral Imager) The DD CASSI consists of two sequentially dispersive arms arranged in opposition so that the dispersion in the second arm cancels the dispersion intruduced by the first arm. A coded aperture is placed between the two arms.

SD CASSI (Single Disperser Coded Aperture Snapshot Spectral Imager) The SD CASSI consists of only a single disersive element. The instrument disperses spectral information from each spatial location in the scene over a large area across the detector.

D

Dimension preserving mapping In a dimension preserving mapping, the measurement $\mathbf{g}$ is embedded in a space of similar dimension with the object embedding space.

I

Image An image is an object density function $f(x)$ defined at points on the object embedding space; $f(x)$ may represent the luminence, spectral density, or scattering desnity of an object.

Isomorphism The goal of a conventional optical imaging system, such as a digital camera,is to create an isomorphism. In the example of the digital camera, the image is converted into a digital form only after it has passed through all the optics between the object and the Focal Plane Array (FPA). The measurement "looks like" the object.

In contrast, computational optical sensors jointly design the optics, the analog-to-digital conversion, and the postprocessing of the measurement in order to optimize some metric or task.

In the context of a discrete imaging system, where the $\mathbf{g}$ represents the measurement and $\mathbf{f}$ represents the object, an isomorphic mapping would mean that $\mathbf{g} \approx \mathbf{f}$

An *Isomorphic mapping* is a one-to-one correspondence between the measurement and the object.

V

Visibility Visibility is a relationship between points in a space. Two points are visible to each other if light radiated from one illuminates the other.