

Compressive Multimodal Imaging Systems

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Multimodal imaging refers to the framework of capturing images in nature that span different physical domains such as space, spectrum, depth, time, polarization, and others. For instance, spectral images are modeled as 3D cubes with two spatial and one spectral coordinate. Three-dimensional cubes spanning just the space domain, are referred as depth volumes.

To-date multimodal imaging requires a set of different sensors, placed in tandem, to simultaneously capture the different physical properties of a scene. Fusion techniques are then employed to mix and extract the information embedded. This talk will describe advances on coded aperture multimodal imaging where multiple image domains are captured by compressive measurement.

A new 4D compressive camera capable of capturing simultaneously 5D data cubes (2D spatial+1D spectral+depth imaging+time) with as few as a single snapshot is described. The applications of such a sensor are self-evident in fields such as computer/robotic vision, medical imaging, and security because they would allow informed decisions not only about the location of objects within a scene but also their material properties.