Hyper Resolution Multi-frame Imaging  
Technology #14572

Applications

Hyper resolution multi-frame imaging can be used to significantly improve image resolution of a physical object. There is an increasing desire for high-resolution images needed for surveillance and facial recognition in various military and law enforcement applications.

Problem Addressed

Although existing image registration methods work well for many imaging-based applications, the current resolution level in these methods do not meet the anticipated increase in demand for higher resolution images. Spatial resolution of a physical object in the infrared spectrum is low when using a single imaging system. Therefore, this technology uses multiple resolutions to find an effective way to improve low-resolution (LR) images.

Technology

The invention is a method to process a “hyper resolution” image of a physical object by using cameras of multiple resolutions (spatial, temporal or spectral). The sequence of images of the physical object is obtained at a plurality of relative displacements with respect to the object by a hybrid camera system comprising of at least two imaging systems. A software program will be used for deriving the super-resolution image. Image sequences derived by each imaging system are co-registered and then reconfigured through a computer algorithm to solve for the resultant sequence of images characterized by a spatial resolution exceeding the first and the second camera imaging resolution.

Advantages

- Improvement in resolution by one or two orders of magnitude
- Co-register sequences of images and motion with low errors

Categories For This Invention:

Photonics  
Sensors (Photonics)  
Cameras  
Imagers

Intellectual Property:

Hyper-resolution imaging  
Issued US Patent
9,251,565

**Inventors:**
Sanjay Sarma  
Long Phan  
Jonathan Jesneck

**External Links:**
Laboratory for Manufacturing and Productivity  
https://lmp.mit.edu/people/sanjay-sarma

**Image Gallery:**