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Data Article

The TNO Multiband Image Data Collection

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ABSTRACT

Despite of the ongoing interest in the fusion of multi-band images for surveillance applications and a steady stream of publications in this area, there is only a very small number of static registered multi-band test images (and a total lack of dynamic image sequences) publicly available for the development and evaluation of image fusion algorithms. To fill this gap, the TNO Multiband Image Collection provides intensified visual (390–700 nm), near-infrared (700–1000 nm), and longwave infrared (8–12 μm) nighttime imagery of different military and surveillance scenarios, showing different objects and targets (e.g., people, vehicles) in a range of different (e.g., rural, urban) backgrounds. The dataset will be useful for the development of static and dynamic image fusion algorithms, color fusion algorithms, multispectral target detection and recognition algorithms, and dim target detection algorithms.

Specifications Table

Subject area	*Digital image processing*
More specific subject area	*Image fusion*
Type of data	*Visual, near-infrared (NIR) and longwave infrared (LWIR) digital images representing different nighttime military and surveillance scenarios.*
How data was acquired	*The images were acquired with different multiband camera systems.*
Data format	*BMP, TIF, MP4*

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Experimental factors	*The images have been geometrically warped and registered so that corresponding image pairs have pixelwise correspondence.*
Experimental features	*The imagery was collected in (semi-)darkness during several outdoor field trials in both rural and urban areas.*
Data source location	*The imagery was collected at different sites in the Netherlands.*
Data accessibility	https://doi.org/10.6084/m9.figshare.c.3860689.v1
Related research articles	See [3] See [2] See [1]

Value of the Data

The dataset will be useful for the development of

- static and dynamic image fusion algorithms,
- color fusion algorithms,
- multispectral target detection and recognition algorithms,
- dim target detection algorithms.

1. Data

The TNO Multiband Image Collection currently consists of three individual image sets:

- The TNO Image Fusion Dataset
- The Kayak Image Fusion Sequence (parts I and II)
- The TRICLOBS Dynamic Multiband Image Dataset

The TNO Image Fusion Dataset [1] contains intensified visual (390–700 nm), near-infrared (700–1000 nm), and longwave infrared (8–12 μm) nighttime imagery of different military and surveillance scenarios, showing different objects and targets (e.g., people, vehicles) in different (e.g., rural, urban) backgrounds.

The multimodal Kayak Image Fusion Sequence [2] contains registered visual, near-infrared and longwave infrared image sequences showing three approaching kayaks in a cluttered maritime background. Because of the variation in distance the targets (kayaks) vary from dim point targets to easily distinguishable objects.

The TRICLOBS Dynamic Multiband Image Dataset [3] contains registered visual (400–700 nm), near-infrared (NIR, 700–1000 nm) and longwave infrared (LWIR, 8–14 μm) motion sequences of dynamic surveillance scenarios in an urban environment. To enable the development or realistic color remapping procedures, the dataset also contains color photographs of each of the three scenes. This dataset was collected during several field trials at three different locations and contains 16 motion sequences representing different military and civilian surveillance scenarios.

All three datasets include publications describing the registration conditions and the used camera systems in full detail.

The data collection will be incrementally extended with new imagery when this becomes available.

The images in this data collection can freely be used for research purposes, and may be used in publications without prior notice, provided this paper is properly referenced.

2. Experimental design, materials, and methods

The original sensor signals were warped and subsampled to achieve pixelwise image registration.

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Transparency document. Supplementary material

Transparency document associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.dib.2017.09.038.

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