

A Sensitive and Fast Image Subtraction Technique (Yeda)

code: T4-1801

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Summary

Image sequences are used in various fields, including medical imaging and satellite/airborne imaging. The comparison between images taken at different conditions (e.g. equipment or configuration, angles, weather and wavelength) can be a highly non-trivial problem, as subtraction artifacts can outnumber real changes between images. The existing remedy for this problem includes highly complex solutions using machine learning algorithms to narrow the sea of candidates. In some cases, human interpretation of images cannot be avoided, resulting in very long processing times. The new method presented here provides a proven solution for the subtraction of images taken at varying conditions. The tool can be applied for any type of imaging, allowing fast processing and accurate results.

Applications

Satellite/airborne imaging
Medical imaging
Defect detection

Advantages

Fast and automatic
Generic, can be applied to various imaging scenarios
Easily implementable into existing systems

Technology's Essence

The new method is used for processing at least two N-dimensional data-measurements (DMs) of a physical-property for detecting one or more new-objects and/or a transition of one or more known-objects, in complex constant-background DMs. Generally, the method includes: (1) generating a filtered-new-DM by match-filtering a new-DM, respective to impulse response of a reference-DM (2) generating a filtered-reference-DM by match-filtering the reference-DM, respective to impulse response of the new-DM (3) generating an N-dimensional object-indicator (OI) by subtracting the filtered-reference-DM from the filtered-new-DM, or vice versa and (4) generating an N-dimensional data score from the N-dimensional OI, where each of the scores is a probe for existence of an object at a specific N-dimensional location.

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