

## Integral Image-Based Differential Filters

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**Abstract :** We describe a relationship between integral images and differential images. First, we derive a simple difference filter from conventional integral image. In the derivation, we show that an integral image and the corresponding differential image are related to each other by simultaneous linear equations, where the numbers of unknowns and equations are the same, and therefore, we can execute the integration and differentiation by solving the simultaneous equations. We applied the relationship to an image fusion problem, and experimentally verified the effectiveness of the proposed method.

**Keywords :** integral images, differential images, differential filters, image fusion

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