

CLAIMS

[Claim 1] An image processing method comprising:

5 a first step of acquiring a measured image measured from a semiconductor device and a first pattern image showing a pattern of the semiconductor device corresponding to the measured image;

a second step of acquiring a second pattern image showing a pattern of the semiconductor device;

10 a third step of acquiring matching information indicating a correlation of the first pattern image and the second pattern image based on the first pattern image and the second pattern image; and

a fourth step of superimposing the second pattern image and the measured image based on the matching information to acquire a superimposed image.

15 [Claim 2] The image processing method according to claim 1, wherein

the third step further includes,

extracting first shape information from the first pattern image,

20 extracting second shape information from the second pattern image, and

acquiring the matching information based on the first shape information and the second shape information.

[Claim 3] The image processing method according to claim 1 or 2, wherein

25 the third step further includes,

adjusting an image size of at least either one of the first pattern image and the second pattern image based on a ratio of a first size of

visual field indicating a range on the semiconductor device of the first pattern image to a second size of visual field indicating a range on the semiconductor device of the second pattern image.

[Claim 4] The image processing method according to any one of claims 1 to 3, wherein

the matching information is at least one of positional information, rotational information, and magnification information indicating a correlation of the first pattern image and the second pattern image.

[Claim 5] The image processing method according to any one of claims 1 to 4, wherein

the measured image is at least one of a thermal emission image, a photo emission image, an electrical quantity change image, an photoinduced current image, a pass/fail information image, a phase image, an amplitude image, and an I/Q image of the semiconductor device.

[Claim 6] The image processing method according to any one claims 1 to 5, wherein the second pattern image is any of a reflection image, a transmission image, a MOBIC image, and a CAD layout image of the semiconductor device.

[Claim 7] An image processing system comprising:

a storage configured to store a measured image measured from a semiconductor device, a first pattern image showing a pattern of the semiconductor device corresponding to the measured image, and a second pattern image showing a pattern of the semiconductor device;

an image analyzer configured to acquire matching information

indicating a correlation of the first pattern image and the second pattern image based on the first pattern image and the second pattern image; and

5 an image processor configured to superimpose the second pattern image and the measured image based on the matching information to acquire a superimposed image.

[Claim 8] An image processing program causing
a computer to function as:

10 an image analyzer configured to, based on a first pattern image showing a pattern of a semiconductor device corresponding to a measured image measured from the semiconductor device and a second pattern image showing a pattern of the semiconductor device, acquire matching information indicating a correlation of the first pattern image and the second pattern image; and

15 an image processor configured to superimpose the second pattern image and the measured image based on the matching information to acquire a superimposed image.

[Claim 9] A storage medium storing the image processing program according to claim 8.

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[Claim 1] A method for superimposing a measured image measured from a semiconductor device and a pattern image showing a pattern of the semiconductor device, the method comprising:

5 acquiring the measured image and a first pattern image showing a pattern of the semiconductor device corresponding to the measured image;

 acquiring a second pattern image showing a pattern of the semiconductor device;

10 acquiring matching information indicating a correlation of the first pattern image and the second pattern image based on the first pattern image and the second pattern image, wherein the matching information is obtained by adjusting an image size of at least either one of the first pattern image and the second pattern image based on a ratio
15 of a first size of visual field indicating a range on the semiconductor device of the first pattern image to a second size of visual field indicating a range on the semiconductor device of the second pattern image; and

 superimposing the second pattern image and the measured
20 image based on the matching information to acquire a superimposed image.

[Claim 2] The method according to claim 1, wherein

 the acquiring matching information step comprises

 extracting first shape information from the first pattern image,

25 extracting second shape information from the second pattern image, and

acquiring the matching information based on the first shape information and the second shape information.

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[Claim 3] The method according to claims 1 or 2, wherein

5 the matching information is at least one of positional information, rotational information, and magnification information indicating a correlation of the first pattern image and the second pattern image.

[Claim 4] The method according to any one of claims 1 to 3,
10 wherein

the measured image is at least one of a thermal emission image, a photo emission image, an electrical quantity change image, an photoinduced current image, a pass/fail information image, a phase image, an amplitude image, and an In-phase/Quadrature (I/Q) image of
15 the semiconductor device.

[Claim 5] The method according to any one claims 1 to 4, wherein the second pattern image is any of a reflection image, a transmission image, a multiphoton absorption (MOBIC) image, and a computer-aided design (CAD) layout image of the semiconductor device.

20 [Claim 6] A system for superimposing a measured image measured from a semiconductor device and a pattern image showing a pattern of the semiconductor device, the system comprising:

a storage configured to store the measured image, a first pattern image showing a pattern of the semiconductor device corresponding to
25 the measured image, and a second pattern image showing a pattern of the semiconductor device;

an image analyzer configured to acquire matching information indicating a correlation of the first pattern image and the second pattern image based on the first pattern image and the second pattern image, wherein the image analyzer acquires the matching information by
5 adjusting an image size of at least either one of the first pattern image and the second pattern image based on a ratio of a first size of visual field indicating a range on the semiconductor device of the first pattern image to a second size of visual field indicating a range on the semiconductor device of the second pattern image; and

10 an image processor configured to superimpose the second pattern image and the measured image based on the matching information to acquire a superimposed image.

[Claim 7] An image processing program for superimposing a measured image measured from a semiconductor device and a pattern
15 image showing a pattern of the semiconductor device, the image processing program causing

a computer to function as:

an image analyzer configured to, based on a first pattern image showing a pattern of the semiconductor device corresponding to the
20 measured image and a second pattern image showing a pattern of the semiconductor device, acquire matching information indicating a correlation of the first pattern image and the second pattern image, wherein the image analyzer acquires the matching information by adjusting an image size of at least either one of the first pattern image
25 and the second pattern image based on a ratio of a first size of visual field indicating a range on the semiconductor device of the first pattern

image to a second size of visual field indicating a range on the semiconductor device of the second pattern image; and

an image processor configured to superimpose the second pattern image and the measured image based on the matching information to acquire a superimposed image.

[Claim 8] A storage medium storing the image processing program according to claim 7.

[Claim 9] A method for superimposing a measured image measured from a semiconductor device and a pattern image showing a pattern of the semiconductor device, the method comprising:

acquiring the measured image and a first pattern image showing a pattern of the semiconductor device corresponding to the measured image;

acquiring a second pattern image showing a pattern of the semiconductor device;

acquiring matching information indicating a correlation of the first pattern image and the second pattern image based on the first pattern image and the second pattern image, wherein the matching information is based on a result of a shape matching process and wherein the shape matching process is done by acquiring low-resolution images of both or one of the first pattern image and the second pattern image at a plurality of resolutions, and matching one of the first pattern image and the second pattern image with the other in sequence from images of low resolution to images of high resolution; and

superimposing the second pattern image and the measured image based on the matching information to acquire a superimposed

image.

[Claim 10] A system for superimposing a measured image measured from a semiconductor device and a pattern image showing a pattern of the semiconductor device, the system comprising:

5 a storage configured to store a measured image, a first pattern image showing a pattern of the semiconductor device corresponding to the measured image, and a second pattern image showing a pattern of the semiconductor device;

10 an image analyzer configured to acquire matching information indicating a correlation of the first pattern image and the second pattern image based on the first pattern image and the second pattern image, wherein the matching information is based on a result of a shape matching process and wherein the shape matching process is done by acquiring low-resolution images of both or one of the first pattern image and the second pattern image at a plurality of resolutions, and matching
15 one of the first pattern image and the second pattern image with the other in sequence from images of low resolution to images of high resolution; and

20 an image processor configured to superimpose the second pattern image and the measured image based on the matching information to acquire a superimposed image.