CLAIMS

[Claim 1]

A fabric information digitization system (100, 600), comprising:

an image capturing apparatus (110) for obtaining a fabric image (400); and

a computing apparatus (120), coupled to the image capturing apparatus (110), comprising an image processing module (121, 321, 622_1),

wherein the computing apparatus (120) is configured to:

execute the image processing module (121, 321, 622_1) to analyze the fabric image (400) to obtain fabric classification information,

determine one neural network module from a plurality of neural network modules (3213, 3213_1 to 3213_P) corresponding to different fabric classifications in the image processing module (121, 321, 622_1) according to the fabric classification information,

input the fabric image (400) to the determined neural network module to generate a normal map (304) and a roughness map (305), and

integrate the fabric classification information, the normal map (304), and the roughness map (305) to generate a fabric file (322).

[Claim 2]

The fabric information digitization system (100, 600) according to claim 1, wherein the image processing module (121, 321, 622_1) further comprises a color analysis module (3211), and the color analysis module (3211) is configured to analyze the fabric image (400) to generate fabric color information (301), wherein the computing apparatus (120) is configured to record the fabric color information (301) into the fabric file (322).

[Claim 3]

The fabric information digitization system (100, 600) according to claim 2, wherein the color analysis module (3211) is configured to generate an overall color histogram, and determine a color number in the fabric color information (301) of the fabric image (400) according to at least one cluster peak of the overall color histogram.

[Claim 4]

The fabric information digitization system (100, 600) according to claim 1, wherein the image processing module (121, 321, 622_1) further comprises a fabric classification module (3212), and the fabric classification module (3212) is configured to analyze the fabric image (400) to obtain the fabric classification information, wherein the fabric classification information comprises fabric manufacturing information (302) and fabric weaving information (303).

[Claim 5]

The fabric information digitization system (100, 600) according to claim 4, wherein the fabric classification module (3212) comprises a support vector machine classification module.

[Claim 6]

The fabric information digitization system (100, 600) according to claim 1, wherein the image processing module (121, 321, 622_1) is configured to perform color transformation on the fabric image (400) and input the color-transformed fabric image (400) into a first generative adversarial network model (3213A) and a second generative adversarial network model (3213B) of the determined neural network module, so that the first generative adversarial network model (3213A) is outputted to the normal map (304), and the second generative adversarial network model (3213B) is outputted to the roughness map (305).

[Claim 7]

The fabric information digitization system (100, 600) according to claim 6, wherein the image processing module (121, 321, 622_1) comprises:

a color hue transformation module (3214_1), configured to transform the fabric image (400) to generate a first color transformation image (401);

a color cluster transformation module (3214_2), configured to transform the fabric image (400) to generate a second color transformation image (402); and

a selection module (3214_3), configured to compare two overall color histograms of the first color transformation image (401) and the second color transformation image (402) to select and input the one with a highest number of cluster peaks and/or a least number of cluster peaks to the first generative adversarial network model (3213A) and the second generative adversarial network model (3213B) of the determined neural network module.

[Claim 8]

The fabric information digitization system (100, 600) according to claim 1, wherein the image processing module (121, 321, 622_1) is configured to mark ruler information of the fabric image (400) according to an image format, and the computing apparatus (120) is configured to record the ruler information into the fabric file (322).

[Claim 9]

The fabric information digitization system (100, 600) according to claim 1, wherein the image processing module (121, 321, 622_1) is further configured to recognize a text pattern in the fabric image (400) to obtain corresponding text information, and the computing apparatus (120) is configured to record the text information into the fabric file (322).

[Claim 10]

The fabric information digitization system (100, 600) according to claim 1, wherein the image capturing apparatus (110) is a flatbed scanner, and the computing apparatus (120) is a cloud server (620).

[Claim 11]

A fabric information digitization method, comprising:

obtaining, through an image capturing apparatus (110), a fabric image (400);

analyzing the fabric image (400) by executing an image processing module (121, 321, 622_1) through a computing apparatus (120) to obtain fabric classification information;

determining, through the computing apparatus (120), one neural network module from a plurality of neural network modules (3213, 3213_1 to 3213_P) corresponding to different fabric classifications in the image processing module (121, 321, 622_1) according to the fabric classification information,

generating a normal map (304) and a roughness map (305) by inputting the fabric image (400) through the computing apparatus (120) to the determined neural network module; and

integrating, through the computing apparatus (120), the fabric classification information, the normal map (304), and the roughness map (305) to generate a fabric file (322).

[Claim 12]

The fabric information digitization method according to claim 11, further comprising:

analyzing the fabric image (400) by executing, through the computing apparatus (120), a color analysis module (3211) of the image processing module (121, 321, 622_1) to obtain fabric color information (301); and

recording, through the computing apparatus (120), the fabric color information (301) into the

fabric file (322).

[Claim 13]

The fabric information digitization method according to claim 12, wherein the step of analyzing the fabric image (400) to obtain the fabric color information (301) comprises:

generating, through the color analysis module (3211), an overall color histogram of the fabric image (400) and determining a color number in the fabric color information (301) of the fabric image (400) according to at least one cluster peak of the overall color histogram.

[Claim 14]

The fabric information digitization method according to claim 11, wherein the step of analyzing the fabric image (400) to obtain the fabric classification information further comprises:

executing, through the computing apparatus (120), a fabric classification module (3212) of the image processing module (121, 321, 622_1) to analyze the fabric image (400) to obtain the fabric classification information, wherein the fabric classification information comprises fabric manufacturing information (302) and fabric weaving information (303).

[Claim 15]

The fabric information digitization method according to claim 14, wherein the fabric classification module (3212) comprises a support vector machine classification module.

[Claim 16]

The fabric information digitization method according to claim 11, wherein the step of generating the normal map (304) and the roughness map (305) comprises:

performing color transformation on the fabric image (400) and inputting the color-

transformed fabric image (400) into a first generative adversarial network model (3213A) and a second generative adversarial network model (3213B) of the determined neural network module by executing the image processing module (121, 321, 622_1) through the computing apparatus (120), so that the first generative adversarial network model (3213A) is outputted to the normal map (304), and the second generative adversarial network model (3213B) is outputted to the roughness map (305).

[Claim 17]

The fabric information digitization method according to claim 16, wherein the step of performing color transformation on the fabric image (400) and inputting the color-transformed fabric image (400) into the determined neural network module comprises:

executing, through the computing apparatus (120), a color hue transformation module (3214_1) of the image processing module (121, 321, 622_1) to transform the fabric image (400) to generate a first color transformation image (401);

executing, through the computing apparatus (120), a color cluster transformation module (3214_2) of the image processing module (121, 321, 622_1) to transform the fabric image (400) to generate a second color transformation image (402); and

executing, through the computing apparatus (120), a selection module (3214_3) of the image processing module (121, 321, 622_1) to compare two overall color histograms of the first color transformation image (401) and the second color transformation image (402) to select and input the one with a highest number of cluster peaks and/or a least number of cluster peaks to the first generative adversarial network model (3213A) and the second generative adversarial network model (3213B) of the determined neural network module.

[Claim 18]

The fabric information digitization method according to claim 11, further comprising:

marking ruler information of the fabric image (400) according to an image format by executing the image processing module (121, 321, 622_1) through the computing apparatus (120); and

recording, through the computing apparatus (120), the ruler information into the fabric file (322).

[Claim 19]

The fabric information digitization method according to claim 11, further comprising:

recognizing a text pattern in the fabric image (400) by executing the image processing module (121, 321, 622_1) through the computing apparatus (120) to obtain corresponding text information; and

recording, through the computing apparatus (120), the text information into the fabric file (322).

[Claim 20]

The fabric information digitization method according to claim 11, wherein the image capturing apparatus (110) is a flatbed scanner, and the computing apparatus (120) is a cloud server (620).