

What is claimed is:

1. A method of controlling access to a secure system, the method comprising:
 - obtaining, by one or more image acquisition devices, a first image of a portion of a human body under illumination by electromagnetic radiation in a first wavelength range, the first image including information on skin texture of the portion of the human body;
 - obtaining, by the one or more image acquisition devices, a second image of the portion of the human body under illumination by electromagnetic radiation in a second wavelength range, the second image including information on subcutaneous or deeper vasculature in the portion of the human body;
 - generating, by one or more processing devices, a composite template that combines information from the first image with information from the second image;
 - determining that one or more metrics representing a similarity between the composite template and an enrollment template satisfy a threshold condition; and
 - responsive to determining that the one or more metrics representing the similarity between the composite template and the template satisfy a threshold condition, providing access to the secure system.
2. The method of claim 1, wherein generating the composite template comprises using a classifier configured to fuse the information from the first image and the information from the second image at one of an early fusion level, an intermediate fusion level, or a late fusion level.
3. The method of claim 2, wherein generating the composite template comprises first generating a first template from the first image and generating a second template from the second image.
4. The method of claim 3, wherein generating the templates for the first and second images comprises extracting, from the first and second images, a respective portion representative of a hand.

5. The method of claim 4, wherein extracting a portion representative of the hand comprises excluding at least partially accessories worn on the hand.
6. The method of claim 1, wherein the skin texture comprise micro features.
7. The method of claim 1, wherein the skin texture comprise at least one of: freckles, spots, moles, lines, and wrinkles.
8. The method of claim 1, wherein the portion of the human body comprises a hand.
9. The method of claim 8, wherein obtaining a first and second image of the hand comprises capturing double-sided images of the hand.
10. The method of claim 1, wherein the first wavelength range comprises between 380 and 600 nanometers.
11. The method of claim 1, wherein the second wavelength range comprises between 700 and 1000 nanometers.
12. The method of claim 1, wherein the one or more metrics comprise one or more of a cosine similarity metric, a Euclidean distance metric, a Mahalanobis distance metric, or a learned data-driven similarity metric.
13. A system comprising,
 - at least one processing device associated with a secure system; and
 - a memory communicatively coupled to the at least one processing device, the memory storing instructions which, when executed, cause the at least one processing device to perform operations comprising:
 - obtaining, from one or more image acquisition devices, a first image of a portion of a human body under illumination by electromagnetic radiation in a first

wavelength range, the first image including information on skin texture of the portion of the human body;

obtaining, from the one or more image acquisition devices, a second image of the portion of the human body under illumination by electromagnetic radiation in a second wavelength range, the second image including information on subcutaneous vasculature in the portion of the human body;

generating, by the at least one processing device, a composite template that combines information from the first image with information from the second image;

determining that one or more metrics representing a similarity between the composite template and an enrollment template satisfy a threshold condition; and

responsive to determining that the one or more metrics representing the similarity between the composite template and the enrollment template satisfy a threshold condition, providing access to the secure system.

14. The system of claim 13, further comprising:

an image acquisition device;

a first illumination source configured to radiate light in the first wavelength range; and

a second illumination source configured to radiate light in the second wavelength range.

15. The system of claim 14, wherein the image acquisition device comprises a field of view facing the second illumination source such that the portion of the human body is between the image acquisition device and the second illumination source.

16. The system of claim 13, wherein generating the composite template comprises using a classifier configured to fuse the information from the first image and the information from the second image at one of an early fusion level, an intermediate fusion level, or a late fusion level.

17. The system of claim 16, wherein generating the composite template comprises first generating a first template from the first image and generating a second template from the second image.

18. The system of claim 17, wherein generating the template for the first and second images comprises extracting, from the first and second images, a respective portion representative of a hand.

19. The system of claim 13, wherein the one or more metrics comprise one or more of a cosine similarity metric, a Euclidean distance metric, a Mahalanobis distance metric, or a learned data-driven similarity metric.

20. The system of claim 13, wherein the skin texture comprise micro features.