

CLAIMS

1. An individual authentication device comprising:
 - a query data acquisition unit configured to extract biometric information of human body surface as query surface information and biometric information of inside human body as query inside body information from one color query image obtained by photographing a human body of an individual, and
 - to generate identification query data from one of the query surface information and the query inside body information, and verification query data from the other of the query surface information and the query inside body information;
 - an identification unit configured to perform 1:N Identification with the identification query data and a plurality of already-registered identification registration data, and
 - to identify one or more verification registration data to be used in verification, the one or more verification registration data being associated with the identification registration data; and
 - a verification unit configured to authenticate a unique individual by performing 1:1 Verification with the identified one or more verification registration data using the degree of similarity with the verification query data; wherein
 - the identification query data and identification registration data belong to a metric space,
 - the identification unit configure to identify one or more verification registration data to be used in the verification by performing the 1:N Identification based on the positional relationship between the identification query data and identification registration data in the metric space,
 - each of the identification registration data has an index value indicating that similar data in the metric space have a same index, and
 - the identification unit configure to convert the identification query data so that similar data in the metric space has a same index, and
 - to perform the 1 : N identification with identification registration data and

the index generated by the conversion.

2. The device of claim 1, wherein

the identification query data and the verification query data have same information structure.

3. The device of claim 1, wherein

the 1:1 Verification is performed on all of the one or more verification registration data.

4. The device of claim 1, wherein

the query surface information and the query inside body information are represented by line components,

the identification query data is data generated by Radon transform performed on one of the query surface information and the query inside body information represented by the line components, and

the verification query data is data generated by Radon transform performed on the other of the query surface information and the query inside body information represented by the line components.

5. The device of claim 1, further comprising:

a registration unit configured to register the identification registration data associated with the verification registration data,

to extract biometric information of human body surface as template surface information and biometric information of inside human body as template inside body information from one color template image obtained by photographing a human body of an individual, and

to generate identification registration data corresponding to the individual from one of the template surface information and the template inside body information, and verification registration data from the other of the template surface information and the template inside body information; wherein

both the identification registration data and verification registration data have same information structure.

6. The device of claim 5, wherein
- the template surface information and the template inside body information are represented by line components,
- the identification registration data is data generated by Radon transform performed on one of the template surface information and the template inside body information represented by the line components, and
- the verification registration data is data generated by Radon transform performed on the other of the template surface information and the template inside body information represented by the line components.
7. The device of claim 1, wherein
- the positional relationship between the identification query data and the identification registration data is a positional relationship between these data and predetermined reference data.
8. The device of claim 7, wherein
- the reference data is plural, and
- the identification query data and identification registration data belong to each of groups based on the positional relationship between each reference data and the identification query data or identification registration data, and same group data have same index.
9. The device of claim 1, wherein
- the query image is an image of a palm of an authentication target individual, the query surface information is a palm print pattern extracted from the query image, and the query inside body information is a vein pattern extracted from the query image.
10. The device of claim 5, wherein
- the template image is an image of a palm of a registration target individual, the template surface information is a palm print pattern extracted from the template image, and the template inside body information is a vein pattern extracted from the template image.

11. An individual authentication method comprising:

in a query data acquisition step, extracting biometric information of human body surface as query surface information and biometric information of inside human body as query inside body information from one color query image obtained by photographing a human body of an individual, and

generating identification query data from one of the query surface information and the query inside body information, and verification query data from the other of the query surface information and the query inside body information;

in an identification step, performing 1:N Identification with the identification query data and a plurality of already-registered identification registration data, and identifying one or more verification registration data to be used in verification, the one or more verification registration data being associated with the identification registration data; and

in a verification step, authenticating a unique individual by performing 1:1 Verification with the identified one or more verification registration data using the degree of similarity with the verification query data; wherein

the identification query data and identification registration data belong to a metric space,

in the identification step, identifying one or more verification registration data to be used in the verification by performing the 1:N Identification based on the positional relationship between the identification query data and identification registration data in the metric space,

each of the identification registration data has an index value indicating that similar data in the metric space have a same index, and

in the identification step, converting the identification query data so that similar data in the metric space has a same index, and

performing the 1 : N identification with identification registration data and the index generated by the conversion.

12. A non-transitory computer-readable storage medium storing a computer

program for causing a computer to perform each step in claim 11.