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Biometric template explainer

🕒 May 9, 2022, 7:16 pm EDT | [Tyler Choi](#)

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Biometric data is compared by algorithms, and therefore typically stored, in the form of templates. A biometric template is a mathematical representation of features or characteristics from the source data, whether a fingerprint scan, facial image, or voice recording. In the enrollment process the source data is collected the template is created, and then stored in a database as reference data.

Matching is performed by capturing probe data, converting it into a template in the same format as the reference template, and then comparing the two templates for verification or identification.



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Template creation often involves pre-processing the sample data, such as to enhance contrast, prior to feature extraction. Sample data can be analyzed with a [quality evaluation algorithms](#), like NIST's [NFIQ 2](#) to determine its fitness for use in template creation.

Hackers and thieves seek out biometric templates because if unprotected they could be used to impersonate the victim for access to valuable information or commit crime. In addition to the risk of being stolen or hacked, potential vulnerabilities include being replaced by an unauthorized template, or traced across various databases as a form of surveillance if associated with other personally identifiable information and improperly secured.

Templates are not images, however, and if properly encrypted, are practically impossible to reverse-engineer images from.

Template data can be encrypted once it enters a database, requiring a key to unencrypt and return it to a readable format.

In authentication or identity verification scenarios, biometric reference templates can be stored for one-to-one (1:1) matching in a discrete secure environment, such as the secure element of a user's mobile device, though on-device template matching on its own does not provide assurance of a particular claimed identity.

Additional methods and technologies in development or relatively new to the market for protecting templates

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from theft or misuse include [bio-hashing](#) and [template splitting](#).

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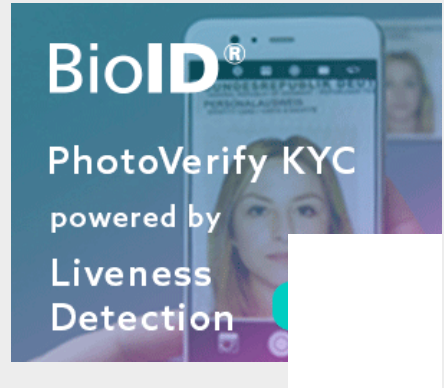
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