

## DATA ANALYTICS

# BIOSYNTHETICS

Realistic, large-scale fingerprint, face, and iris image datasets.

Privacy-protective biometric datasets enable large-scale performance testing and demonstration system development.

## DATA TO SUPPORT REALISTIC BIOMETRIC PERFORMANCE MEASUREMENT

Biometric systems deployed for applications such as duplicate detection, watchlist searching, and border management must maintain matching accuracy and throughput rates, even as scale and transaction volumes increase. System designers and algorithm developers often lack access to test data during design and testing phases, undermining real-world performance and destabilizing operational systems. This may be due to privacy restrictions that inhibit access to representative data.

## FEATURES & BENEFITS

Designed for government and commercial organizations with large-scale biometric projects, as well as biometric researchers and vendors, Biosynthetic datasets provide the following benefits and features:

- Dramatically reduce the time, effort, cost, and privacy risks associated with biometric dataset creation and management.
- Scale to millions of unique images per modality, modeling large-scale operational databases.
- Support next-generation multimodal fusion testing and prototyping.
- Enable realistic accuracy and scalability testing for government, commercial, and research applications.
- Support creation of custom datasets to mirror unique biometric data requirements.
- Generate high, medium, and low quality images with realistic error rates for a wide range of operational and test scenarios.

## FINGERPRINT

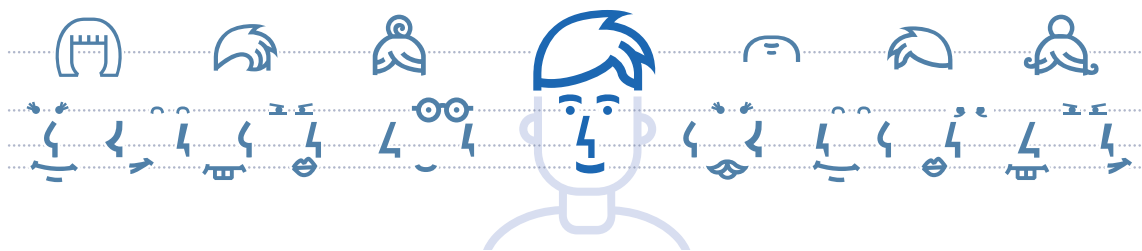
Biosynthetic fingerprint images are realistic flat or rolled fingerprints that emulate impressions from FBI-certified optical scanners. To ensure fidelity and accuracy, Biosynthetic fingerprint image datasets have representative pattern class, size, shape, frequency, and minutiae distributions. Users can specify gender, fingerprint position(s), and quality levels, enabling the creation of difficult datasets that present challenges for fingerprint matchers. Biosynthetic fingerprint datasets generate false match rates roughly identical to those of real fingerprint datasets, supporting testing of large-scale identification systems.

## FACE

Biosynthetic face images are frontal, neutral-expression faces with natural lighting. Face images have an interocular distance of ~150 pixels. To ensure representative performance in comparative tests, Biosynthetic faces have realistic skin texture, coloration, features, hairstyles, and hairlines. Biosynthetic face datasets can be created to reflect operationally relevant ethnicities and gender distributions. Biosynthetic face images generate false match rates within an order of magnitude of real face images. This supports testing of face recognition algorithms in applications such as document issuance and fraud detection.

## IRIS

Biosynthetic iris images are realistic, non-occluded irises similar to those acquired by commercial iris recognition devices in operational environments. Biosynthetic irises are ~220 pixels in diameter with the texture and structure of real irises, generating false match rates identical to those of real iris images. Biosynthetic irises can be simulated with high, medium, and low quality levels, based on contrast and boundary shape. This supports testing of iris recognition algorithms in identification applications.



## CUSTOM BIOSYNTHETIC DATASET GENERATION

Novetta generates and delivers custom synthetic image datasets – up to 10 million fingerprints, 2 million irises, and 1 million faces – for organizations with specialized quality or demographic needs.

## USER INTERFACE

The Biosynthetics software uses a single interface to generate synthetic fingerprint, face, or iris images with separate screens for “Synthetic Generation,” “Dataset Status,” “Dataset Viewer,” and “Dataset Details.” These screens allow users to adjust parameters used to define the generated datasets, monitor image generation status, and review and filter generated datasets. The interface also allows synthetic image datasets to be exported.